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MYSORE-MADRAS ARBITRATION.

ENQUIRY INTO THE QUESTION OF STORAGE OF THE CAUVERY WATERS WITHIN MYSORE TERRITORY.

VOL. III.

SELECT EXHIBITS FROM TI MYSORE AND THE MADRAS CASES FILED BEFORE THE BITRATION COMMITTEE.

1913-14.

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ENQUIRY INTO THE QUESTION OF STORAGE OF THE CAUVERY WATERS WITHIN MYSORE TERRITORY.

Mysore Reply to the Madras Rejoinder presented on the 27th November 1913 to the Arbitration Committee.

Reply to Part V of the Madras Case.

PART I.—THE TRUE INTERPRETATION OF THE AGREEMENT OF 1892.

---

1. The interpretation of "fair and reasonable" suggested by Mysore holds good as Madras do not seriously challenge it in their rejoinder. No good reasons have been shown to controvert the position taken up by Mysore in this respect.

Madras paragraph 4.

2. As Sections 26 and 27 of the Limitation Act or the Indian Statute Law were the only ones in force both in Mysore and Madras at the time of the agreement, the proper presumption is that they alone were present before the minds of the parties thereto. This view is practically conceded by Madras.

Madras paragraph 5.

3. Abandonment of an easement is a question of *fact* to be determined by the Arbitrator in the light of all the *facts* and circumstances before him. Under the Agreement of 1892, it is not enough if the right claimed was acquired but it is also necessary that it should be "actually existing" when the dispute arose.

Madras paragraph 6.

In the concluding portion of para 6 of the Rejoinder, the Mysore case has been incorrectly understood and stated. Mysore do not contend that the claim to 7 ft. on the Cauvery Dam was abandoned but only that the right, if any, to the one foot flow over the Upper Anikat must be presumed to have legally ceased after the remodelling. There is no "remarkable inconsistency" in the Mysore case if it is rightly understood. Its essential parts are briefly as follow:—

(i) The user of *7 ft. of water* at the Cauvery Dam for irrigation can, at best, be deemed to have commenced only in 1896. The prescriptive period for 7 ft. is not thus fulfilled, but Mysore admit the prescriptive use of 6 ft. of water at this place for irrigation.

(ii) The plea of abandonment is not urged with reference to the Cauvery Dam but it applies only to the 1 ft. flow over the Upper Anikat.

(iii) At the Cauvery Dam 7 ft. flow did often exist even before 1896; but it was for purposes other than *prescriptive use of water for irrigation*. Hence under the terms of the agreement no right to 7 ft. of water at the Cauvery Dam for irrigation can be founded upon such circumstance alone.

4. It is gratifying to note that Madras do not repeat the claim to all the water flowing towards the sea. "Particular acreage" is still contended by Mysore to be relevant in determining the *extent* of the prescriptive right of Madras as judged by the sole recognized lgal test of *user*. The authorities quoted by Madras were not referred to in detail in the Mysore reply as they are obviously irrelevant under the terms of the agreement which prescribe the law of prescription as applicable to all disputes arising thereunder. Whatever force such authorities coming under the law of riparian rights and the international law would have had before 1892, they are now precluded from consideration by reason of the agreement. Hence, the Mysore reply observed the passages concerned to be of "little importance" or "merely of academic value." (*Vide* para 4 of the Madras Rejoinder also.) The American and Indian authorities referred to in the Rejoinder also stand on the same footing.

Madras paragraph 7.

5. The admission of Madras that their complaint is not of the inevitable disturbance of the existing conditions of the *river flow* is noted. But the cases cited in paragraph 22 of the Mysore reply appertain to disturbances of an *immaterial* character of *all easements* in general.

Madras paragraph 8.

6. The legal contention of Mysore that the alleged right to the 1 foot above the 6 ft. of flow has not matured into a prescriptive right is based on the fact that its enjoyment by Madras is not 20 years old as required under the agreement and the law applicable thereto. The Arbitrator has to determine the question of fact.

Madras paragraph 9.

7. Mysore accept the view of Madras that the private law of easements cannot ordinarily apply to Administrations such as Madras and Mysore. But it is open to them to agree as between themselves that the principles of the private law of prescription should, as far as possible, govern the disputes concerning their interests. This is precisely what has been provided for by the Agreement of 1892. Yet, it does not follow that all the principles of such law *en bloc* should apply to the case. The reasonable deduction to be made is that only such principles as can be directly or analogically applied with appropriateness to the present dispute should be taken into account. If this essential distinction is borne in mind, it will be seen that the observations of Madras in paras 10 and 12 are devoid of force.

Madras paragraph 10.

8. As already observed in para 4 above, the extent of land irrigated is an important criterion in determining the extent of user or in other words the extent of the prescriptive right. So far at least, the contention of Mysore should hold good. The delta tract as a whole including the Coleroon irrigation cannot be taken into account *irrespective of the user*; and no user for irrigation can be proved in regard to the 1 ft. flow over the Upper Anikat. Small variations in locality or extent may be permissible, but there can be no substantial addition to the quantity of water required beyond what has been used in accordance with prescriptive rights. It is not disputed that the user of water which has passed our boundaries does not affect us in any way; but we cannot be required to refrain from diminishing the flow to any extent not covered by the prescriptive right "already acquired and actually existing."

Madras paragraph 11.

9. The argument of Mysore based on the analogy of an easement of necessity does not apply to the 7 ft. user, if any, on the Cauvery Dam as the opening sentence of paragraph 12 of the Madras Rejoinder incorrectly assumes. That argument, it is clear from a perusal of the Mysore reply, was employed only with reference to the 1 ft. claimed over the Upper Anikat.

Madras paragraph 12.

The right in question is, it is true, not such as to come under the terms of Section 41 of the Easements Act, nor is it strictly speaking such an easement of necessity as is ordinarily understood in the law of easements appertaining to private parties. Admittedly, the latter law is applicable to the parties here not in its entirety but only by analogy. The nearest approach in the private law of easements to the claim for 1 ft. over the Upper Anikat is an easement of necessity and Mysore still contend that the general principles of the same should be borne in mind in deciding the claim.

Of course it could not be said that there was any severance of tenement in this case; and the arguments about extinction were and could only be meant to be applied analogically.

10. The correct view of the Mysore case regarding the Upper Anikat and the Cauvery Dam is as follows:—The Upper Anikat existed and still exists for the purpose of securing the irrigation supply required for delta; but this supply is measured off at the Cauvery Dam. In other words, the Upper Anikat is but a regulator and is not an indivisible legal unit as now represented by Madras but it consists of two distinct parts from the standpoint taken by Mysore. The Upper Anikat has no direct connection with the extent of the prescriptive right which has to be determined only by the conditions that have prevailed at the Cauvery Dam. In order to secure 7 ft. flow at the latter place, it used to be necessary before the remodelling but not afterwards, to waste 1 ft. of water over the Upper Anikat. According to the contention of Mysore, this 1 ft. of water was not prescriptively used for irrigation in the delta; and it is on this question of fact, that all the arguments of Mysore regarding the claim to 1 ft. are entirely based. As, after the remodelling, 7 ft. at the Cauvery Dam could be secured without this waste of 1 ft. at the Upper Anikat, the purpose of the latter ceased, assuming that it amounted to an easement. The observations of Madras entirely overlook the cardinal features of the Mysore case with respect to this 1 ft. supply. They are, firstly, that the claim to it does *not* amount to a prescriptive right or easement within the meaning of the Agreement of 1892: and secondly, that even assuming for the sake of argument that it did, the right is not "actually existing" for the several reasons urged analogically in the main in paragraph 15 of the Mysore Reply.

Madras paragraph 13.

11. As Madras have stated that the legal cases quoted by them have not been noticed individually by Mysore, a brief note commenting on such cases is hereto annexed (Appendix Q). This note shows that the cases have little or no bearing on the points in dispute as already pointed out by Mysore.

———

Reply to Part VI of the Madras Case.

PART II—PRESCRIPTIVE RIGHTS.

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12. The expression "extent of prescriptive rights" occurring in the law of prescription and also used in the terms of reference cannot apply to the flow in the river as contended by Madras *irrespective of the needs of the particular area irrigated* for the prescribed perid, *viz.*, 20 years, necessary to acquire prescriptive rights. That this right does not extend to the mere flow is perfectly clear from Rule III of the Agreement of 1892 and this has been fully dealt with in paragraphs 12 and 13 of Part I of the Mysore case, (My. 6); and the arguments put forward by Madras do not adequately meet the points raised by Mysore in this connection.

Madras paragraph 1.

13. The important application of the terms of Agreement of 1892 to the Harikanave tank project immediately after the agreement was ratified by both the parties deserves special notice. This clearly shows that the mere flow irrespective of the requirements of prescriptive irrigation cannot be considered in settling the prescriptive rights. Madras have also impliedly admitted this view in their Rejoinder as they have not made any attempt to reply to this point of the Mysore case.

Thus, in the words used by Madras, the second issue "confines the matter to fixing the limit flow at the Upper Anikat" which is actually necessary for the protection of the existing area of irrigation which has been under cultivation for the prescriptive period.

14. If the argument of Madras, *viz.*, the limit flow of water alone, is to be considered independently of any reference to the flow actually required for the extent" of irrigated area, then there was no necessity for clause 2 (*a*) in the terms of reference framed by the Arbitration and duly accepted by Madras; as clause 2 (*b*) alone would have conveyed the sense now imported into it by Madras. In respect of this very case, in the terms of reference proposed and communicated in a telegram to the Hon'ble the Resident in Mysore by the Madras Government, the first clause runs as under:—

> (I) "What is the quantity of water to which Madras is entitled for requirements of existing irrigation both above and below Upper Anikat and which should during the different months of the year be passed down by Mysore before impounding at Kannambadi reservoir?"

From this it is apparent that Madras themselves intended "the quantity of water" or flow is not to be independent of the requirements of irrigation. Such requirements should be fixed with reference to the existing area or extent of irrigation. Thus, it is clear that the word "extent" used in the terms of reference can only refer to the area of irrigation which can claim water as a prescriptive right. In this sense, the arguments put forward in the Mysore case (My. 7) in paragraphs 24, 26 and 27 are perfectly relevant.

Area of Madras Irrigation.

15. Mysore do not deny that Madras are entitled to the benefits of the remodelling works so far as they do not imply abandonment of the rights already acquired and so far as they are co-extensive with the prescriptive rights actually existing. At the same time, Mysore are entitled to claim the benefits of

Madras paragraph 2.

abandonment which such works may reasonably suggest and this is precisely what Mysore have urged. But, if the principle sought to be applied by Madras is to be accepted, then, going backward to the time when no improvements of any sort had been made, the whole flow of the Cauvery would be considered as necessary for the irrigation of the cultivated area. But the very fact that Madras themselves have abandoned such a claim and confined their rights to a little over the quantity represented by the 7 feet flow at the Cauvery Dam is a clear admission that the argument of prescriptive right to mere flow cannot be sustained. This makes it necessary that Madras should prove that the whole of the flow now claimed is really required and actually utilised for the irrigation of the area for which Madras have acquired a prescriptive right.

On the other hand, positive proofs are adduced by Mysore from the very records put forward by Madras that less than the quantity now claimed was authoritatively considered as "full and ample" for their irrigation requirements. So, the claim now put forward by Madras will have to be considered exorbitant and therefore untenable.

16. There is no need to consider the converse of the Mysore argument and contend that, if Madras allowed their works to fall into disrepair, they could claim a larger quantity of water. No responsible Government would allow such a thing to happen as it would mean direct or indirect loss both to the Government and to the people.

17. It has been admitted in paragraph 10 that "176,334 acres were cultivated by Madras above the Upper Anikat prior to 1890 is no doubt true." It is therefore difficult to understand why the inference drawn by Mysore from this clear circumstance is contested. The natural inference is that unless it is shown by proper records that a larger area was cultivated in previous years, the area that can have water as a prescriptive right must be confined to 176,334 acres and the additional area, *viz.*, 32,294 acres, cannot claim water as a prescriptive right.

Madras paragraphs 3 to 10.

18. The total area under the Lower Anikat may be accepted as 112,000 acres. But it is important to limit the area under the Veeranam tank to 45,000 acres, as distinctly mentioned in the Madras Government Order No. 400-1, dated 24th September 1909, as this area is closely connected with the claim for 644 m. c. ft., over the Upper Anikat put forward by Madras.

19. It is requested that, before settling the extent of Madras prescriptive rights, the area of irrigation above the Upper Anikat prior to 1890, say, in the years 1880 and 1885, may be definitely ascertained. Madras have stated that they have already asked for information about the exact area under the Veeranam tank from the Revenue Department; similar information may be called for in the case of area above the Upper Anikat also, as now indicated.

QUANTITY OF WATER REQUIRED.

20. The quantity of water necessary to protect the prescriptive right of Madras has to be measured by certain limits of flow. These limits will have to be considered under two heads, separately, *viz.*, on the Cauvery Dam and on the Upper Anikat. In actual practice all these years, only the former has been used for the delta irrigation and the latter can be considered only in connection with the Lower Anikat irrigation. These quantities being separate and flowing in two distinct channels and also being separately measured, they cannot now be added together or redistributed in any different manner as now proposed by Madras. For, the prescriptive right has to be considered, as already stated, with reference to the flow required for meeting the actual irrigational requirements of particular areas and not merely to the flow in general.

Madras paragraphs 11 and 12.

Although a flow of 7 feet on the Cauvery Dam might have meant also a flow of 644 m.c.ft., over the Upper Anikat under old conditions, this latter flow could not have been used for the delta irrigation. It is therefore not permissible to divert it for use now for the delta irrigation either partly or wholly, as such a diversion would make the burden on Mysore more onerous and would further be opposed to the law of prescription.

21. The matter has now therefore to be considered under two distinct heads, *viz.*,

(*a*) the limit flow on the Cauvery Dam for delta irrigation, and

(*b*) the flow of 644 m. c. ft., over the Upper Anikat as having reference to the requirements, if any, of the Lower Anikat irrigation.

The question has therefore been dealt with in the Mysore case under these two obviously distinct heads. Any intentional or unintentional supply of water of over 7 feet on the Cauvery Dam in past years will have to be dealt with on its own merits under the requirements of the delta irrigation. The flow of 644 m.c. ft., over the Upper Anikat which could not have been formerly used for the delta irrigation should not be mixed up with the quantities required for the latter.

REQUIREMENTS OF THE CAUVERY DELTA.

22. The limit flow required for the delta irrigation is mentioned here and also in paragrah 9 of Part III (Ma. 9). But the quantity that might have been used for scouring, through the under sluices of the Upper Anikat, has been mixed up with that actually required over the Cauvery Dam for the supply of the delta irrigation. It cannot be denied that the two items are quite distinct from each other and served two distinct purposes. With such a clear distinction, the present claim of Madras is tantamount to a limit flow of 6½ feet on the Cauvery Dam connoting a discharge of 1,950 m. c.ft. in 24 hours, to meet the demands of the delta irrigation.

Madras paragraph 13.

But Madras have unjustifiably added the requirements for scouring, through the under sluices as well as the previous unavoidable flow over the Upper Anikat to the requirements of the delta irrigation, although the original conditions do not now exist. Such an addition to the flow actually required for the delta irrigation would not represent the real prescriptive right but something more. This latter claim cannot be admitted by Mysore.

23. It must be stated at the outset that the provisional acceptance of the 7 feet limit by Mysore was not based on any examination of the prescriptive rights of Madras.

Madras paragraph 14.

It is noted that Madras admit that their "prescriptive rights are the same under all sizes of work proposed by Mysore." This is an admission that the magnitude of the Mysore proposals could not be of much consequence to Madras as long as their prescriptive rights now to be determined are duly respected by Mysore.

24. Madras have now made a reference to casual conversation with the late Chief Engineer who has made no note of the point. It would have obviated this reference, had a copy of the communication to Sir John Benton been furnished to the Mysore Government.

Madras paragraph 15.

25. The reference to the Bhavani project was made by Mysore to secure one more item of evidence in corroboration of other direct evidence available from the Madras records in respect of the delta requirements. The statement of Mr. Larminie, made in connection with the Bhavani project which is so analogous to the Mysore project, fixes definitely the exact limit flow necessary for the delta irrigation. This could not be considered as his individual opinion, for he merely pointed out "that the recognised full supply for the delta in the south-west monsoon is 6 feet on the guage at Cauvery Dam and that the Tanjore cultivators had a right to expect it whenever it comes naturally." The expression "recognised full supply" clearly indicates that it could not be his individual opinion. The expression "whenever it comes naturally" distinctly shows that this limit could not have been considered as indicating a constant or continuous flow. Even if this statement be construed as representing his opinion, it cannot be set aside as it comes from such an experienced officer and as it was advanced in the best interests of the delta cultivators *when opposing the Bhavani project.*

Madras paragraph 17.

26. There is no force in the contention that at the time (1900) the statement was made by Mr. Larminie, the rules of 1896 then in force prescribed 7 feet. Mr. Larminie was an old officer and, from his long experience, he must have referred when he used the words "recognised full supply" to the requirements as

Madras paragraph 18.

they had been recognised for very many years prior to 1896 and not to the limit that had been introduced into the rules of only four years' duration, as this short period could not have by any means secured such a recognition. The rules of 1882 for regulation at the Upper Anikat and those of 1888 for regulation at Cauvery-Vennar regulators, must have been in his mind when he spoke of the recognised full supply.

27. Mysore stated that, on account of raising the top level of the gates, facilities for forcing 2 feet extra supply had been afforded, showing that the previous supply was 6 feet, as it is admitted that 8 feet could be forced by the new arrangement. There is nothing in the explanation now given which necessitates a modification of the Mysore statement.

Madras paragraph 19.

28. When the rules of 1882 were framed, the Cauvery and the Vennar regulators were not in existence and the floods passed through the open heads of these rivers "without restriction." Under such conditions no useful or definite information can be had about the quantity of water actually required for the crops by merely looking to the gauge readings. Such information can only be had from the rules which distinctly specify the limits indicating a "full and ample" supply.

Madras paragraph 21.

29. The fact that on 67 occasions the floods rose to 7 feet or over at the Upper Anikat, on 40 occasions to 8 feet and over, and on 89 occasions to 6½ feet and over, during the years 1882 to 1895, clearly indicate:—

(*a*) that, before the construction of the regulators, a very large quantity over and above the "full and ample supply," must have unavoidably passed into the open heads of the Cauvery and Vennar rivers, and

(*b*) that, after the regulators were constructed, extra quantities had to be let in more for the safety of the regulators than for actual requirements of irrigation.

Thus, the right to a larger quantity of water than 6 feet for delta irrigation cannot be established by the mere fact that the gauge records showed higher depths of flow.

30. It is stated that, in a rising river, the opening of the sluices at a level of 6½ feet above Cauvery Dam which would generally tend to lower the level by about 6 inches would not have reduced the supply below this limit. But the river cannot be rising always. The fact remains that the reason for fixing a limit of not less than 6½ feet for opening the under-sluices is that such opening would tend to reduce the water level by 6 inches; without water standing at least at 6½ feet on the Cauvery Dam, the 6 feet limit could not be ensured consistently with the opening of the under-sluices.

Madras paragraph 22.

31. No definite conclusion in regard to the interpretation of the old rules can be arrived at from the fact that 7 feet was fixed as the full supply level after the remodelling, for the conditions of the Upper Anikat must have become very unsatisfactory before the remodelling was started. In fact, in paragraph 33 of Part II of their case (Ma. 8), Madras state that the accumulations of sand gave much trouble prior to remodelling and, naturally, it must have been in consideration of such accumulation, that 7 feet was fixed in the later rules.

Madras paragraph 24.

32. Madras have attempted to refute the interpretation of Mysore that the 7 feet mentioned in the 1882 rules as well as in the rules of 1896 was due to the accumulation of sand and the consequent reduction in the water way.

Madras paragraphs 26 to 28.

In doing this, Madas base their arguments on the theory of the critical velocities deduced by Mr. Kennedy and published in 1895. A reference to page 38 of Belassis' Hydraulics will show that this theory was quite unknown before Mr. Kennedy discovered it and the argument that the framers of the rules of 1882 had this theory in view cannot carry much weight.

Thus, notwithstanding the explanation of Madras, the fact remains that about 6 inches of higher flow was generally allowed for scouring and another 6 inches to

make up for the anticipated accumulation of sand and the consequent reduced waterway. Hence, the full supply limit cannot be taken as anything higher than 6 feet.

Madras paragraph 29.

33. The quantities shown here for different gauge readings on the Cauvery Dam, include the flow over the Upper Anikat as well as that passing through the under-sluices. But it has been shown that the quantity over the Upper Anikat or through the under-sluices could not have helped the irrigation of the delta proper and the quantities actually passing over the Cauvery Dam only have to be considered. It may be noted that the Madras Government have shown a flow of 669 m. c: ft., through the under-sluices for the 6 feet gauge on the Cauvery Dam. It is difficult to understand how this flow could be included according to the rules of 1882 which clearly enjoin that the scouring sluices are not to be opened until the water rose to 6·5 feet. Thus the quantity due to Madras with the 6 feet gauge in accordance with the rules of regulation is only 1,625 m.c.ft.

Madras paragraph 30.

34. Here there is an implied admission by Madras that the interpretation put upon the rules of 1882 by Mysore, *viz.*, that 6 feet represents the limit flow for the delta irrigation, cannot be lightly set aside.

The rules of 1896 and of later dates, not being of 20 years standing, have no prescriptive value.

Madras paragraphs 31 and 32.

35. Whatever might have been the requirements for scouring before the remodelling, no such special quantity of water is now required for the purpose. The water used for scouring might have been enjoyed as an easement of necessity prior to remodelling but that has now ceased. This quantity is now sought to be used for irrigation. Such a change of user is inadmissible even from a legal point of view, as shown in paragraph 15 of the Mysore case.

Madras paragraph 33.

36. Between 1882 and 1895 there were 89 occasions when the Cauvery Dam gauge read between 6½ and 7 feet and out of these only on 26 occasions were the scouring sluices opened. This indicates that the regulation could not have been strictly according to the rules. This is what was meant by Mysore by "non-operation of the rules."

Madras paragraph 34.

37. The description of the Calingula now given confirms the Mysore view that this was intended to help in surplussing excessive and unnecessary supplies flowing over the 5½ feet limit on the Cauvery Dam. Major Oakes in the passage now quoted states that this depth is about 6 feet 3 inches. Surely, one of these figures is wrong. Evidently, the sill level of the Cauvery Dam and the crest level of the Calingula have not been altered since they were constructed. It is therefore likely that Major Oakes must have made a mistake in taking 6¼ feet instead of 5½ feet. Such a mistake is all the more probable because the discharge of 32,130 cusecs mentioned by Major Oakes cannot be relied upon. Thus, there is nothing to disprove the conclusions shown in paragraph 44 of the Mysore case (My. 7) that the Calingula gives one more proof to establish that 6 feet was the real limit of flow required for the delta irrigation.

Madras paragraphs 35 and 36.

38. The expression " limit of flow" used by Mysore has not been correctly understood. What Mysore meant is quite unmistakably expressed in their paragraphs 45 and 46 (My. 7). This "limit of flow" is the " full and ample" supply of 17,344 cusecs mentioned in clause 1 of rules of 1888 and not any higher figure. The higher discharges referred to in the rules, 2, 3, 4 and 5 up to the point when a difference of 4½ feet between the front and rear gauges is reached, could not possibly be construed as necessary for irrigation. This has been made quite clear in paragraphs 47 to 49 of the Mysore case (My. 7).

Madras paragraphs 36 to 39.

39. From this point of view, the arguments here adduced by Madras need only a passing notice, as they cannot be taken to modify the interpretation of rules as shown in paragraphs 45 to 51 of the Mysore case (My. 7). The rules as such refer only to the regulation of floods. A reference to a certain passage in Vol. III of the Metur Project is made

here. The same passage was referred to in paragraph 45, Part II (Ma. 7). The explanation therein given has been clearly rebutted by Mysore in paragraph 49 of their case (My. 7).

40. In paragraph 39, Madras admit that in distributing the flow between the Cauvery and the Vennar "the proportion is abandoned" beyond 23,140 cusecs. With this admission of abandonment, it is difficult to realise on what grounds Madras try to make out that all flow up to the point giving a difference of 4½ feet between the front and rear gauges, was necessray for actual irrigation. Such abandonment must necessarily mean that these canals had to be and are even now being treated in the flood season as rivers to dispose of the excess waters as much as possible when it could be done without danger of submersion of the surrounding country. Such extra flow cannot have any reference to the full supply requirements of the delta irrigation. The limit flow prescribed in rule 2, *viz.*, 15,000 cusecs in the Cauvery and the 8,140 cusecs in the Vennar, should also be taken in this light as representing the flow which may not cause any injury to, and not as the flow necessary for, the crops beyond the "full and ample supply" limits mentioned in rule 1.

41. No doubt the full supply for the Cauvery is mentioned as 4½ feet on the rear gauge and as 8 feet for the Vennar under clause 2 of the 1902 rules relating to the regulation in non-flood season. A glance at clause 1 under the same head will make it quite clear that these higher limits were specified only for alternate distribution of supplies between the Cauvery and the Vennar on certain days. This means that one or the other of the two canals had practically very little supply during such periods; to make up for the deficiency, larger limits had to be allowed into each of the canals in turns. Thus, these higher limits taken simultaneously as now attempted to be done, cannot represent the actual requirements of the crops.

42. That a flow of 6 feet on the Cauvery Dam really represented the actual requirements of the delta area is further confirmed by the figures given in this paragraph. They specify the limits of flow to be maintained by the subordinate staff at the Cauvery and the Vennar according to the recent rules of 1905 and 1909. Here the flow considered necessary and up to which if possible the subordinate staff are enjoined to maintain is distinctly mentioned as 20,850 cusecs, connoting a gauge of only about 6·2 feet at the Cauvery Dam. Considering that special facilities have been created by the remodelling of 1902 for admitting a larger quantity of water than before, it is quite clear that the comparatively small excess of 20,850 over 17,344, *viz.*, 3,506 cusecs, is only due to such improvements. This goes fully to further confirm the view that the limit flow of 6 feet really represented the full irrigation requirements before the remodelling of 1902.

Madras paragraph 41.

43. In fact, by comparing the rules of 1888 with the rules of 1905, it will be readily observed that the first clause of each of the two sets of rules is quite identical in their import. The injunction that the Anikat Superintendent shall maintain whenever possible the rear gauges of the Cauvery and the Vennar so as to secure a total discharge of 20,850 cusecs, clearly fixes the limit of useful supply beyond which the flood conditions would commence, in the same way as when "the full and ample" supply of 17,344 cusecs in clause 1 of the rules of 1888 is exceeded.

It is noteworthy that, even in the most recent rules of 1909, the injunction to the Anikat Superintendent fixing the limit supply at 20,850 cusecs, remains unchanged.

It should be remembered that such injunctions to the subordinate staff are generally given so as to err on the safe side regarding the sufficiency of supplies and, in this light, the limit defining correct requirements may be taken as somewhat less.

44. Thus, all discharges indicated by higher rear gauge readings must be, more or less, due to the convenience of flood regulation rather than to actual requirements of the delta irrigation. Any inferences drawn from the mere gauge readings of the Cauvery and the Vennar regarding the quantities necessary for the delta irrigation, cannot be conclusive. Accordingly, the distinction between *deliberate and obligatory* supplies brought in as an argument in paragraph 42, cannot stand in the face of the specific supplies mentioned in clause 1 of both the sets of rules.

Madras paragraphs 41 to 44.

45. With the object of claiming larger limits, Madras have gone to the extent of allowing their rules "to go by the board," although, in paragraph 42 of Part III (Ma. 9), they distinctly state that "the Madras prescriptive rights are established by the rules of regulation actually in force from time to time," with the water registers being taken as corroborative evidence. And now that it has been shown by Mysore that the rules do not support the excessive claims of Madras, they have gone to the other extreme of throwing the rules overboard.

Madras paragraph 45.

46. It it not quite clear whether Madras want to make out that the flow of 17,600 cusecs, here mentioned, was passing down the Cauvery alone without taking into account the corresponding flow in the Vennar. This latter would be about 9,500 cusecs at the stage of the above flow in the Cauvery, giving a total of 17,600 +9,500=27,100 cusecs. It is difficult to believe that Major Oakes should have computed such a large flow as due to a 6 feet gauge on the Cauvery Dam. The quantity, 17,600 cusecs, obviously represented the flow in the river Cauvery above the heads of the two main branches, the Cauvery and the Vennar. With due allowance for transmission losses and discharge over the 150 yards Calingula, this tallies with the discharge due to 6 feet gauge as recently computed by Madras.

With this explanation, paragraph 55 of the Mysore case (My. 7) does not require any alteration.

Madras paragraph 47.

47. Thus, all the objections brought forward by Madras in their Rejoinder against the 6 feet limit established by Mysore as necessary for delta irrigation have been duly answered and any claim of Madras for a higher limit of flow thus becomes untenable.

Madras paragraph 48.

48. It has been repeatedly stated that 25 to 30 per cent extra allowance has been made over the Metur Project supplies to make up for fluctuations in river flow from day to day. By the word "supplies" used in this connection, Mysore only meant daily supply limits and not the yearly total supplies realised with these constant limits. The argument of Madras in this paragraph does not therefore need any further explanation and the point noted in paragraph 56 of the Mysore case (My. 7) remains unaltered, particularly as Madras say that the Metur Project is a record of "unbiassed and independent expert evidence" throwing valuable light on the matter at issue.

Madras paragraphs 50 and 51.

49. Notwithstanding all the arguments in these two paragraphs, the fact remains that the table (Appendix D, My. 7) shows distinct wastage of water at the Lower Anikat both in the first and second fortnights of June. It should be remembered that this wastage has occurred after the dry canals have all been duly wetted and after the interstices in the river bed have been duly filled in. In consideration of these large wastages and of the fact that there is practically no irrigation in June, the limits of flow for this month to be fixed as a prescriptive right should be considerably less than those necessary for July and August.

In order to establish their contention, they rely on no stronger evidence than the alleged inaccuracy of their own discharges. Notwithstanding any possible errors, it is needless to add that the general conclusions drawn from the table (Appendix D, My. 7) cannot by any means be overlooked.

50. Even according to the Madras computations for absorption in the river bed in early June, the quantity required for this purpose would be considerably small. There is always some flow in the river, particularly now after the installation of the Power Works at Sivasamudram. So the quantity required for absorption per mile may be taken as two-thirds of what is shown by Madras, *i.e.*, $(3\frac{1}{2} \times \frac{2}{3})$ or $2\frac{1}{3}$ m.c.ft. In the whole length of the river course between Kannambadi and Cauvery Dam, a distance of 250 miles, this quantity would amount to $250 \times 2\frac{1}{3} = 583$ m. c. ft. This is equivalent to a single day's flow of 6,705 cusecs. Such a small quantity can very well be met out of the limit allowances made in the Mysore rules even after meeting all other demands.

51. Also, much cannot be made of the 50 per cent extra allowance said to have been made in the Metur Project for absorption in the canal beds. A reference

to page 29, paragraph 39 of Vol. III of Metur Project, shows that such allowance is only made for absorption between the reservoir and the canal head (Grand Anikat) with no addition for absorption in the canal beds as alleged in paragraph 50, Part VI (Ma. 12) and paragraph 17, page 12 of Part III (Ma. 9). This shows that the limits of fortnightly supplies have been fixed in the Metur Project so as to cover the latter item also.

Madras paragraph 52.

52. The point raised here about the inadequacy of 25 to 30 per cent over Metur Project limits has been fully answered in the Mysore case ; *vide* paragraph 8, My. 4, page 78 of the printed Proceedings. It has already been shown that all the water passed through the canals cannot be considered to have been necessary for irrigation requirements and so any argument based upon a comparison of such total quantities with those resulting from the application of the Mysore limits cannot be accepted as conclusive.

Madras paragraphs 53 to 54.

53. At the end of paragraph 54, Madras state that their " rights extend to the quantity and mode of user and are not restricted to the least quantity on which a cropped area might escape from loss or failure of crop." In making this assertion, Madras are taking up a position directly opposed to what law and equity permit in respect of the exercise of their prescriptive rights. First, there can be no prescriptive right to the mere customary flow of water irrespective of its use for irrigation as already shown, and secondly, the Law of Easements only allows the dominant owner to exercise his rights in a way that is least onerous to the servient owner. Any violation of this principle will be directly contrary to the express provision made in the Agreement of 1892 that the settlement of the prescriptive rights should be based on " fair and reasonable " considerations.

54. If this important principle is kept in view, the point raised regarding the possible loss that might have been caused even in the years when no remissions have been granted, becomes untenable. The only year in which it has come to notice that any considerable amount has been allowed as remission is 1899-1900. A reference to paragraph 9, page 44 of the Madras Triennial Administration Report for 1901-02, shows that these remissions were mostly due to damage done to crops over large tracts near the coast owing to excessive rainfall during the north-east monsoon," rather than to deficiency of supplies, in the south-west monsoon, notwithstanding that this was the worst year on record so far as the south-west monsoon floods are concerned. The tables (Appendix G) show that, with the limits proposed by Mysore, the quantity available for Madras irrigation in 1899-00 will be as much as 132,000 m.c.ft., against 129,416 m.c.ft., actually thrown on the fields in accordance with the limits of flow prescribed in the rules of regulation of 1888.

Madras paragraph 55.

55. It has been repeatedly stated that the Cauvery and the Vennar are really old rivers taking floods as they come and no idea can be had of the real requirements of irrigation by the mere quantity of flow through these rivers. Such a correct idea can only be gathered from the rules of regulation and, as long as Mysore rules allow quantities in conformity with such specified limits, there should be no reason to complain. Sir John Benton appears to have drawn his conclusions by the mere quantities of flow at the Cauvery Dam without reference to the prescribed rules for regulation. So the apparent difference in the conclusions pointed out is not really of much consequence. In fact, the high peaks of flow are far beyond irrigation requirements involving much waste of water into the sea. The extraction of some of this water during the peak periods for storage in Mysore is not therefore likely to cause any material disturbance in the supplies needed for Madras irrigation.

Madras paragraphs 56 to 58.

56. A reference to the working tables (Appendix P, My. 8), will show that the impounding in the Mysore Reservoir is mostly confined to the months of July and August. As the flow in the river in these months is really very abundant, the extraction of a fraction of the flow will still leave more than sufficient water for all Madras requirements even in the worst years.

57. It must be remembered that the area of irrigation in Madras depends on the available flow during July and August and the good condition of the crops, on

the rainfall in October and November. Both these conditions will be unaffected by the Mysore Reservoir; the former on account of the comparatively small storage in Mysore during the months when floods are abundant; and the latter, on account of the more or less sure and certain rainfall in the north-east monsoon in the delta area. This is one more reason why Mysore urge that the construction of their reservoir will not materially interfere with the irrigation requirements of Madras.

58. In Appendix G of the Mysore case (My. 7) it has been shown that the quantities that would be available for Madras irrigation even after the impounding is done, with the limits of flow as shown in the Mysore rules, are in most of the instances prior to remodelling greater than the quantities utilised as computed by Sir John Benton. It is found on examination that Sir John Benton has, in every case, taken the figures for discharge, as computed and given by Madras in their annual and triennial reports, as the basis of his computations and multiplied those figures by the number of days in the respective crop periods also given in the same reports.

59. So far, the method of computations adopted by Sir John Benton is perfectly right. Errors, if any, can only arise in the discharge figures given in the Madras printed reports. They show that these discharges represent the total flow at the head of the Cauvery and the Vennar. But the column "supply utilised" in the duty table of these reports is left blank. This omission introduced an element of uncertainty as to the quantity of water actually utilised. But there is an explanation in regard to this in paragraph 8, page 8, of the Triennial Irrigation Report for 1901-02, which is quoted here for ready reference. "The latter information (*i.e.*, the total quantity of water supplied per acre of crop during the whole period the canals are open) has been given in the table above, but it must be noted that the quantity of water passed off through drainages has not in any case been measured, and this omission must give a wholly false idea of the quantity of water used."

60. This shows clearly the precise extent up to which the figures given in the printed reports may be considered as unreliable. As Sir John Benton's computations are only based on these discharges, the natural inference is that the totals arrived at by that officer give too high results as the quantity passed off through drainages has not been deducted.

As Mysore have shown that the total supplies according to their rules are greater than the already excessive figures given by Sir John Benton, the limits in their rules must be considered quite sufficient.

61. A different set of tables has also been prepared showing the quantities actually utilised on the fields according to the rules of 1888 within the limits considered "full and ample" *viz.*, 11,240 cusecs on the Cauvery and 6,104 cusecs on the Vennar. The totals thus computed for the years 1890 to 1910 are given in Appendix G_1, fortnight by fortnight, as compared with the totals accruing from the limits proposed by Mysore. Here too, the latter set of figures are in many cases greater than, and in others nearly equal to, the quantities actually used for irrigation in accordance with the rules and there can thus be no fear whatever that the limits proposed will interfere with the legitimate supply actually required for the delta irrigation.

62. The sufficiency of supplies allowed by the limits of the Mysore rules may be looked at in yet another way. The average annual rainfall may be taken as 40 inches as a mean over the whole delta area. Of this, about not less than 30 inches may be taken as useful fall in the irrigation season. It is well known that the maximum requirement of the rice crop is represented by a total depth of 72 inches of water above the fields, of which about one-fourth would be generally available as tail water. Thus the quantity of canal water required to supplement the useful rainfall of 30 inches noted above, would be represented by a depth of (72−30=)42 inches, on the field; here, no account is taken of the tail water referred to above which may be conveniently used on lower fields.

63. The total area of delta irrigation is 890,000 acres. The quantity of water required for this on the above basis of a depth of 42 inches, or 3½ feet, on the fields is 3½ (feet) × 890,000 (acres) × 43,560 (square feet)= 135,689 m. c. ft. This quantity affords a proper measure of the annual requirements of the delta irrigation.

64. From Appendix G, it will be seen that the figures computed by Sir John Benton on the basis of discharges given in the Madras Reports, is, in almost all cases, greater than the above quantity of 135,689 m.c.ft. This confirms the view expressed in paragraph 60 that the Madras Reports give too high discharges.

Again, considering the quantities resulting from the limits of Mysore rules, it will be found that, except in the year 1899-00, in all other years, the resulting quantities are much greater than the above-noted measure of proper supply. This also shows that the limits proposed would amply provide for all requirements of the delta irrigation.

65. Mysore do not suggest that a standard of a bad year should be applied alike to all years. They only urge that, in judging the effects of impounding in a bad year, the conditions actually realised in the delta also in such bad year, should be taken into consideration. A re-perusal of the Mysore paragraph 63 (My. 7) will make this clear.

Madras paragraph 59.

66. While admitting the right of Madras to 6 feet in the height of the south-west monsoon season, when also the irrigation demand is greatest, Mysore have all along been urging that the same limits should not be enforced throughout the irrigation season for reasons repeatedly given on various occasions. So a mere computation of figures shown in Appendix G. (My. 7.), (*a*) for uniform limit of 6 feet, and (*b*) for varying limits of the Mysore rules, cannot be taken to indicate any admission on the part of Mysore that they accept the former limit.

Madras paragraph 60.

67. It may be remarked that, for the period of the greatest demand, *viz.*, July, August and first half of September, there is no difference between the two sets of figures. There is some difference observable in June. As there is very little demand for irrigation in this month, Madras interests are not really affected. There is also some difference in the months of October to January. But, in these months, there is abundant rainfall in the delta area and this would more than make up for the slightly smaller figures.

All this shows clearly that the limits proposed by Mysore would not really affect Madras interests.

68. Mysore fail to see the distinction made between the two clauses referred to in the latter portion of this paragraph, *viz.*—

Madras paragraph 70.

(1) *what supply will adequately safeguard Madras interests, and*
(2) *what limits of flow measured at the Upper Anikat are necessary to conserve the prescriptive rights of Madras unimpaired.*

If it is meant that the latter gives any title to Madras to the mere flow at the Cauvery Dam as such irrespective of the actual requirements of irrigation, Mysore emphatically deny such a claim.

69. It is admitted by Madras that "reductions of supply passed to irrigation are not infrequently made after heavy falls of rain in the months of October and November," that the rainfall is much the heaviest along the coast where most of the irrigated area in the delta is situated and that it would be possible "as an act of grace" to allow Mysore to impound quantities in addition to what is allowed by the rules on account of continuous and well-distributed rainfall.

Madras paragraph 71.

Mysore note these admissions and only urge that the rules put forward in this connection (Ap. H., My. 7) may be tried and modified or improved as may be necessary, so that a fair and proper allowance may be made in reducing the limits of flow on account of the rainfall in the delta.

Requirements of the Coleroon System.

70. It has been often shown that the claim of 644 m.c.ft. cannot have any bearing on the requirements of the delta irrigation. Madras have themselves admitted in paragraph 14 of Part III of their case (Ma. 9) that this flow is mainly required for the Coleroon

Madras paragraphs 72-75.

irrigation, though mention has been made therein of some occasional extra demands for the delta said to be based on existing practice. Also, to show that 644 m. c. ft. were mainly required for the Coleroon irrigation, Madras have worked out detailed tables in paragraph 41 of Part II of their case (Ma. 8). In the first table under this paragraph, they show that a free flow of 6,430 cusecs is necessary above the Lower Anikat to secure a discharge of 1,100 cusecs in the Vadavar and that 15,519 cusecs are required to secure 1,260 cusecs with a view to secure an extra 190 cusecs alleged to be required for replenishing the Veeranam tank.

71. From all this it is clear that Madras attempted to prove that the quantity of 644 m.c.ft., was required for supplying the Veeranam tank. This has been shown, in paragraphs 66 to 77 of the Mysore case (My. 7), as quite unnecessary either for the Veeranam tank or for the direct area under the Lower Anikat, as the leakage water from the delta irrigation has been found to meet all such requirements. Madras have now changed their position in a marked manner and want to treat the requirements of the Coleroon irrigation as a secondary matter by stating that " the limit of their prescriptive rights at the Upper Anikat with reference to the irrigation of the Cauvery delta includes a flow of 644 m.c.ft. per day when available over and above the discharge due to 7 feet on Cauvery Dam."

72. The claim for 644 m.c.ft. is now altered on the plea that this water is necessary to meet such occasional demand. It should be remembered that the practice referred to is not specifically recognised in the rules of regulation at the Grand Anikat prior to remodelling. Only in the rules of 1905 and 1909, the Anikat Superintendent is enjoined to alter the gauge readings in the Cauvery and the Vennar to suit the requisitions of the Canal Engineers. It will be found that such alteration more often refers to the securing of a reduction of the flow rather than an increase. Even if the latter holds good on some occasions, the practice can only be said to have come into existence after 1905, and therefore cannot have any value as a part of the prescriptive right of Madras. Thus, the demand for 644 m.c.ft. cannot be connected with this existing practice.

73. Such a change of position cannot help Madras in securing a larger prescriptive right. If 644 m.c.ft. flowing over the Upper Anikat into the Coleroon is not required for the Coleroon irrigation, it cannot certainly be claimed for the delta irrigation. The whole question about the inadmissibility of 644 m.c.ft. on either of these considerations has been dealt with in paragraphs 15 and 16 of the Mysore case (My. 6) to which a reference is requested.

Madras paragraphs 77-78.

74. It is admitted by Madras that, when there is an adequate supply for the delta, no special supply is required for the Coleroon system. But such adequate supply to the delta has now been stated to be not less than a flow of 7 feet per day at the Upper Anikat. If this standard of 7 feet and over is to be seriously considered, there will be very few days even in good years when such a high standard is at all obtained. In the Metur Project, the 7 feet standard flow has not been provided even for the month of the highest demand, and at this rate there can be no adequate supply at all to the delta, if the Metur Project should come into operation, and consequently none for Coleroon irrigation.

75. If, on the other hand, it is to be taken that, as explained by Madras, due provision has been made for the Lower Coleroon irrigation in the several fortnightly limits fixed in the Metur Project, Mysore have only to state that the project does not distinctly allow any special flow *across the Upper Anikat into the Coleroon* to directly serve the needs of the Coleroon irrigation. This is all that was meant by the statement in paragraph 70 (My. 7) that no special provision has been made for the Coleroon irrigation.

If it is contended that the fortnightly allowances over the Cauvery Dam made in the Metur Project will produce sufficient leakage into the Coleroon to meet all the requirements of the Lower Anikat system, it can be stated that, with about 30 per cent extra limits now made by Mysore, such leakage would not be materially diminished. If anything, the conditions that would arise after the Mysore Reservoir is built would be much more favourable than what could be obtained with the Metur Reservoir for reasons stated in paragraph 70 of the Mysore case (My. 7).

76. Madras, however, now state that Col. Ellis who prepared the Metur Project made a mistake in connection with the provision for the Coleroon irrigation. This is in contrast with their statement that the projected Metur Reservoir will give sufficient water for the existing irrigated area (*vide* paragraph 2, Part VI).

Madras paragraph 79.

Here " the existing irrigated area" includes the area under the Coleroon. A reference to the clear details in paragraph 4 of page 30, Vol. III of the Metur Project, will show that Col. Ellis has not made any mistake, but has made suitable and adequate provision for all the requirements of the lower irrigation on the same liberal scale as for the delta area. Accordingly, the limits of flow in the Mysore rules based on the Metur Project limits, would produce sufficient leakage and seepage in the Coleroon without any such specific allowance as the quantity of 644 m.c.ft., now demanded.

77. This is corroborated by the daily discharge tables now attached (Appendix K_1), from which the fortnightly discharges in Appendix K have been compiled. It will be seen that the flow in the Lower Anikat canals has been maintained from day to day practically throughout the whole period, except rarely in floods, without any specific flow into the Coleroon either at the Upper Anikat, the 150 yards Calingula or at the Grand Anikat.

Madras paragraph 81.

78. Madras now contend that the Lower Anikat discharge figures are unreliable. All that Mysore urge is that although some of the discharges for individual days may be incorrect here and there, the general utility of the figures on the whole, cannot be set aside and the broad inferences drawn therefrom cannot be refuted.

Madras paragraphs 81 and 82.

It will be seen that the total quantities of leakage in the Coleroon were 20,594 m.c.ft., 63,634 m.c.ft., 54,439 m.c.ft., 103,112 m.c.ft., in the years 1899-1900, 1904-05, 1905-06 and 1906-07, respectively. The quantities used for irrigation in the same years were 16,090 m.c.ft., 20,655 m.c.ft., 25,436 m.c.ft., and 27,454 m.c.ft., respectively. It will also be seen that the quantity used as per column 10 is, in every fortnight with some exceptions, less than the quantity of leakage as per column 8.

A glance at Appendix K_1 will also make it clear that in several months of each year, while column 6 shows no discharge, column 7 shows considerable quantities. Also, the same Appendix further proves that figures in column 7 in most of the instances are greater than those in column 6, indicating that the extra flow in column 7 could only have been derived through leakage which is admitted by Madras to be "visually" clear to any one who has seen the works.

79. It is a matter for special notice that the total daily discharges in all the channels taking off at the Lower Anikat is less than the seepage quantity as already noted. There is no reason to infer that the same condition will not obtain with the supplies allowed in the Mysore rules even after the Kannambadi Reservoir comes into operation.

Madras paragraph 83.

80. It should be stated that the conditions of supply at the Lower Anikat can be studied better by daily discharge tables now appended (Appendix K_1) than by mere "fully explained" descriptions of the Lower Anikat.

Madras paragraph 84.

81. A reference is invited to the sub-paragraph under paragraph 38, Part II, (Ma. 8) beginning with the words "it will be seen", where it is distinctly stated that "the Veeranam tank does not begin to impound" until there is a flow of 25,674 cusecs at the Lower Anikat. The quantity of 644 m. c. ft. claimed would mean only about 7,500 cusecs and such a flow in the Coleroon would not accordingly be useful for the Veeranam tank.

Madras paragraph 86.

82. It is clear that, unless there was great necessity, the Madras Government would not have gone to the expense of remodelling the Upper Anikat. In this connection a reference is requested to sub-paragraph under paragraph 27, page 7, Part II of the Madras case (Ma. 8), beginning with the words "trouble was however experienced from the accumulations of sand" and to sub-paragraph under paragraph 33, page 9, Part II, (Ma. 8), extracted below for ready reference. "The lowering of the crest of the

Madras paragraph 87.

Upper Anikat has obviated the necessity for constant attention to the matter of scouring sand, while the system of passing floods at the lower level of the crest has prevented the accumulations which gave so much trouble prior to remodelling."

Madras paragraph 88.

83. A close reading of the second clause of this paragraph will show that Mysore have stated exactly what Madras have admitted regarding the under-estimating of high floods. Whatever may be the object of adopting the lower figures for floods and even allowing for caution on the side of safety referred to by Madras, the fact remains that the results of high flood discharges have been represented at a lower limit than the actual discharges.

Madras paragraph 89.

84. This matter may not be material to Madras, but as the Mysore Reservoir depends mostly on the interception of high floods, it is of vital importance to Mysore that these high floods should be correctly measured and estimated. This has also an important bearing on the sufficiency of supplies for the Coleroon irrigation.

Madras paragraphs 92 to 96.

85. Mysore have only to point out in regard to filling the Veeranam tank that the conditions here advanced by Madras are based on questionable assumptions. The best way of judging about the actual conditions is by a study of the available statistics showing the daily discharges in the Vadavar including the replenishment into the Veeranam tank and how such discharges have been obtained. Enough has already been stated to show that all such requirements have been met from the large amount of seepage into the Coleroon.

Madras paragraph 98.

86. The description given by Mysore of the effects of remodelling of the Lower Anikat is practically the same as what is here admitted by Madras. The real conditions of replenishment of the Veeranam tank in particular and of the supply of the Lower Anjkat in general have been repeatedly explained by Mysore.

87. After all, the Mysore Reservoir intercepts only a portion of the floods coming from a fraction of the catchment area above the Upper Anikat and a proper consideration of the whole case will show that the interference with the quantity or incidence of floods at the Cauvery Dam will not be materially affected either in connection with the delta or the Coleroon requirements.

Madras paragraph 99.

88. Mysore note that Madras have agreed as to what should be done if the power supply is altogether closed or altered in any way convenient to Mysore. It is understood that the claim of Madras is limited to the average estimated natural flow of the river in the months of February to May subject to the customary irrigation rights of Mysore.

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Reply to Part VII of Madras Case.

PART III—PLACE AND MODE OF MEASUREMENT.

89. The system of proportionate measurement, though not mentioned in paragraph 80 of the Mysore case, has been discussed fully in paragraphs 98 to 103 (My. 8); and working tables have also been prepared for this system. (*Vide* Table 1 of Appendix P.) The disadvantages of this system to Mysore have been shown in paragrahps 101 to 103 (My. 8).

Madras paragraph 1.

90. Why the method proposed by Madras of measuring the discharges at the four higher anikats cannot be accepted by Mysore has been fully explained in paragraphs 82 to 84 of the Mysore case (My. 8) and nothing new has now been added by Madras to render an alteration of the previous view necessary.

Madras paragraph 3.

91. A careful study of Appendix X (Ma. 10) prominently shows one or two important features which require a further investigation. There is practically no irrigation between the Bhavani Bridge and the Dhanakere Anikat; the river runs more or less through rocky country in a comparatively narrow channel; yet in this reach a total loss of as much as (227,889—193,221=) 34,668 cusecs has been shown during the short period to which the observations refer. On the other hand, in the reach between the Bhavani Bridge and the Cauvery Dam, a gain of (195,046—193,221=) 1,825 cusecs has been shown during the same period. It should be remembered that the river in this reach is much wider and also sandy and that there is a large area of irrigation amounting to as much as 99,500 acres. When all this is duly considered, this gain appears inexplicable. These observations were confined to a short period of about 20 days in September. In this month the Bhavani was not flowing at all over the lowest weir and there was no contribution from the Amaravati and the Noyel. The conclusion is therefore irresistible that something is wrong with the observed discharges either at Dhanakere, the Bhavani Bridge or the Cauvery Dam or at all the three places.

92. It is on this account that a special set of observations is necessary to arrive at the exact relation of flow in the different reaches of the river by gaugings specially conducted for the purpose at the several places mentioned in the Mysore rules. (*Vide* Rule 8.)

93. Mysore note the admission made by Madras regarding the necessity for occasional independent check of discharges at the Cauvery Dam. The velocity observations conducted in 1909, upon which the available discharges at the Cauvery Dam are based, are already four years old; and it would be desirable to have check observations conducted at suitable intervals in the future.

Madras paragraph 7.

94. The special computations referred to in paragraphs 57 to 62, Part IV, (Ma. 10), are based upon three considerations—

Madras paragraph 9.

(*a*) the difference between Sivasamudram and Bhavani Bridge discharges,

(*b*) the centage allowance made in the Metur Project, and

(*c*) certain remarks of Mr. McHutchin, a former Chief Engineer of Mysore.

Of these,

the value of (*a*) is practically *nil* as it is based upon over-estimated discharges at Sivasamudram,

(*b*) refers only to a particular portion of the river and is based upon more or less empirical considerations and not on special observations, and

(*c*) is an opinion referring to a small quantity of water to be passed for power in the hot season with a dry river bed and cannot be made generally applicable.

95. It is on this account that Mysore again urge that special observations are necessary in the different reaches of the river mentioned in the Mysore rules, to find out transmission losses as well as the quantity required for intermediate irrigation.

Madras paragraphs 11 and 12.

96. It is noted that Madras have "no objection" to the time of transmission being made the subject of further examination. For this purpose also, the observations suggested in the Mysore rules would prove suitable.

Madras paragraph 13.

97. Mysore agree that the items (*a*), (*b*) and (*c*) mentioned here may be fixed tentatively. For the method of measurement recommended by Mysore, items (*d*) and (*e*) included in their paragraph 91 (My. 8) would no doubt become unimportant as long as there is no appreciable increase in the intermediate irrigation between Sivasamudram and Cauvery Dam.

Madras paragraph 16.

98. The method proposed by Madras may safeguard their own interests, but this is most unfavourable to Mysore. Here no account whatever is taken of the abundant intermediate replenishment, while so much is made of the occasional transmission losses. If, however, a clear account of all the replenishment is kept and also of all the water used for intermediate irrigation, a fair result can be arrived at, which might be acceptable to both parties. The method of measurement advocated by Mysore in a way obviates such computations and is fair to both the parties.

Madras paragraphs 18 and 20.

99. As regards the extension of irrigation above the Mysore reservoir referred to, all that is necessary has already been stated in paragraphs 96 and 97 of the Mysore case (My. 8).

Madras paragraphs 21 to 23.

100. As regards the contention made here by Madras, a reference is requested to the concluding paragraph 32 (v) of Sir John Benton's Note of 12th May 1911 (Ma. 9), wherein that officer lays down that "the Mysore Durbar are to have all the surplus supplies to which they have any claim under the existing agreement placed unconditionally at their disposal." This is all that Mysore have to urge. Whatever may now be settled as the prescriptive rights of Madras, the quantity of water flowing over and above what is necessary to conserve such prescriptive right should be "unconditionally placed" at the disposal of Mysore for being impounded in the Kannambadi Reservoir. This is strictly in accordance with the Agreement of 1892. In settling the present question it need hardly be stated that all considerations of future projects should be excluded and the reference here made by Madras to such future extensions is contrary to the provisions of the Agreement and to the spirit of the enquiry.

Madras paragraphs 21 to 23.

101. If any such project becomes necessary, either in Mysore or Madras, the matter should be settled on its own merits with a view to make such modifications as may be necessary in the method of measurement.

Accordingly, judged on its own merits, the Mysore system of measurement as per Table III of Appendix P, will be found to be quite simple in its application and quite efficient in safeguarding the prescriptive rights of Madras.

102. If, however, as implied by Madras in paragraph 23, an absolute finality is desired in settling the relative rights of Madras and Mysore to the waters of the Cauvery so as to leave "both States as far as practicable free to develop their own resources," the question evidently must form the subject of a separate enquiry on a much broader basis. This evidently does not fall within the scope of the present Arbitration.

MODE OF MEASUREMENT PROPOSED BY MYSORE.

103. While it is admitted that no system can be devised which would absolutely prevent all wastage into the sea, Mysore contend that any method which reduces such wastage to a minimum without materially interfering with Madras interests, should receive due consideration at the hands of the Arbitration Committee; and it is plain that the Mysore method satisfies this condition better than any other method so far proposed.

Madras paragraphs 24 to 26.

104. Why the purely proportional method, as shown in table 1 under Appendix P of Mysore case, (My. 8), is disadvantageous to Mysore has already been explained. Even after satisfying the prescriptive rights of Madras a very large quantity of water runs to waste by this method, as also by the Madras method. But the avowed object of the Mysore project is, as alredy stated, to utilise, as far as practicable, all such waters running to waste after duly meeting the prescriptive rights of Madras. With this object in view, Mysore have suggested a mode of measurement as shown in table III (Appendix P).

105. Madras have carefully examined the method and admit that this is an improvement on the old method proposed by Mysore. They object to the table mainly on the score (*a*) that the impounding produces a *minus* discharge at the Cauvery Dam on certain days and (*b*) that a part of the compensation water is shown as running to waste.

Madras paragraphs 28 to 31.

106. As regards the *minus* quantities, a careful examination of the tables will show that this result is due to the assumption that the time of transmission of flood between Kannambadi and the Cauvery Dam will be 3 days. If this time is properly ascertained after careful observations, for different stages of flow, the quantity of *minus* discharges can be considerably reduced. Although in high floods the time of transmission may be less than three days especially when the floods are continuous, ordinary floods may require four days. This is apparent from a comparison of the discharges at the Cauvery Dam and the Kannambadi Reservoir, as given in the tables already prepared.

107. Accordingly, a fresh set of tables have been worked out with four days and the result shows an improvement. An abstract of the more important figures from the detailed tables is attached (Appendix R).

108. The figures relating to the *minus* quantities (columns 21 to 23) are given below with details month by month:—

Months	1899				1902				1905				1913			
	3 days' interval		4 days' interval		3 days' interval		4 days' interval		3 days' interval		4 days' interval		3 days' interval		4 days' interval	
	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity
June ...	4	2,383	2	507	4	1,485	3	1,142	4	1,846	3	1,071	3	456	2	300
July ...	...	...	...	...	3	1,296	...	...	1	1,306	...	...	...	...	...	...
August ...	2	2,046	1	1,194	...	...	...	...	...	...	...	...	...	...	...	...
September ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
October ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
November ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
December ...	...	...	...	...	...	...	...	...	3	211	3	273	...	...	...	...
Total ...	6	4,429	3	1,701	7	2,781	3	1,142	8	3,363	6	1,344	3	456	2	300

It will be observed that, by taking four days, the quantity of *minus* flow is considerably reduced in each year, the reduction being most noticeable in the worst year on record. A more careful computation of the time of transmission will still further reduce these *minus* quantities.

109. Regarding the deficiency in the supplies referred to by Madras, the following marked improvement is observed by adopting four days instead of three :—

Years	Deficit with 3 days	Deficit with 4 days	Useful surplus up to 7 feet
	m.c.ft.	m.c.ft.	m.c.ft.
1899	7,439	2,298	17,133
1902	8,593	4,993	10,539
1905	6,456	4,664	29,203
1913	1,638	1,476	34,027

In all the four years, the quantity of water in deficit is reduced considerably. The reduction in the worst year (1899) from 7,439 m.c.ft., to 2,298 m.c.ft. deserves special notice. Even this cannot be called a real deficit, because, although on certain days the deficit was observable, there is still on other days a large quantity of surplus water which Madras can use, if they choose, up to the limit of 7 feet which they are demanding, as shown in the last column above; such surpluses, it would be noticed from the tables, closely follow periods of deficit. If this useful surplus quantity is taken into consideration, the deficit is more than made up. In fact, this surplus is as much as 2 to 21 times the quantity in deficit. This means that, although, on a few days, the flow is somewhat reduced, there will be very many occasions on which Madras may take in a large quantity of water even up to their own limit of 7 feet. The total quantity of water available for cultivation according to the rules, will therefore remain unaffected and no serious disturbance in its distribution is proved by the tables.

110. It is rather misleading to convert the deficit quantities noted above into their corresponding acreage value, as Madras have done. There would have been some justification for such conversion, if there were no source of supply to make up for these deficits. If the useful surplus be converted into acreage on the same principle, the results will be somewhat as below :—

Year	Deficit	Equivalent in acres	Useful surplus	Equivalent in acres	Extra acres in favour of Madras
1899	7,439	37,000	17,133	85,000	48,000
1902	8,593	43,000	10,539	50,000	7,000
1905	6,456	32,000	29,203	145,000	113,000
1913	1,638	8,000	34,027	170,000	162,000

Instead of a deficit in the area of cultivation, varying from 6,000 to 37,000 acres as made out by Madras, they can obtain if they choose an extra cultivation ranging from 7,000 to 162,000 acres in the same years, notwithstanding the impounding done by Mysore.

111. The only other point to which Madras have raised an objection against the Mysore method is that the incidence of flow would be disturbed by impounding in the Mysore reservoir. Here it may be asked what is the nature of this incidence ? There is no fixed standard of incidence from day to day that would be repeated year after year and therefore it is not understood what is meant by a disturbance in the incidence of flow.

If there is a particular curve of flow at the Cauvery Dam in any year, it is quite admitted that the maintenance of the same curve would not be possible, consistently with impounding in the Mysore reservoir. But this should not affect Madras at all, if the flow up to the limits prescribed remain more or less the same even after impounding in the Mysore reservoir.

112. From Appendix R, it will be seen that the impounding is confined to from 50 to 60 days in the whole season. Out of these, the compensation water

is due for about 10 to 30 days only. The compensation water acts as a balancing factor on 7 to 20 days. Thus the real disturbance due to impounding is confined to from 3 to 10 days in a year. This period is so small that it can be safely said that no injury worth the name will be caused to the lower irrigation.

113. Also, the quantity of compensation water which disturbs the flow varies from about 3,000 m. c. ft. to 11,000 m. c ft. or from 1 to 5% of the total resulting flow at the Cauvery Dam. Of this, nearly half acts as balancing factor, helping Madras when the natural flow is low. The real deficit would be confined to about 0·5% to 2·5% of the total flow at the Cauvery Dam. Even this shows that the disturbance to the delta irrigation is brought down to a minimum. The effect of this insignificant disturbance can be more than made up by the large quantity of useful surplus noted above. (*Vide* table in paragraph 109 *supra*.)

114. It is true that the same quantities of flow, without the reservoir, will not be available on the same days, as with the reservoir. But within a few days of any such disturbance, a fairly abundant supply is invariably available and can be readily utilised to make up for the disturbance. The cultivation in the delta has been practised from time immemorial by taking advantage of freshets whenever they came. If this is remembered, there is no reason to fear that the insignificant disturbance due to impounding in the Mysore Reservoir will cause any real injury to the delta irrigation.

115. It may be noted that, in three out of the four of the years under consideration, the daily discharges at Kannambadi have been obtained by computations ; while, in one year, *viz.,* 1913, they are actual discharges based on daily observations. The results of the Mysore method can be judged better by the real discharges of 1913 than by computed and therefore somewhat hypothetical discharges. A study of the several tables noted above clearly shows that the disturbance due to impounding in the Kannambadi Reservoir as judged by the quantity of compensation water, has been the least in 1913, although the number of days in which impounding was done was the largest. This means that tables based on computed daily discharges as contrasted with actual observations cannot be expected to give any conclusive results. At the most, such computations will serve to give a fair idea of the total annual flow. This would be useful for fixing tentatively proportionate factors that the discharges at Kannambadi bear to those at the Cauvery Dam in the two monsoon seasons.

Madras paragraph 32.

116. The mere fact that compensation water comes in as a factor in the Mysore working tables, cannot be taken as any recognition on their part of the insufficiency of the proportionate factors (assumed in the table) to safeguard the Madras interests. Merely with the idea of securing absolute non-interference with the incidence of flow, the position taken by Madras in claiming that very high factors should be fixed cannot be justified. This would mean that the conditions of the very worst year should be imposed on Mysore against impounding. Madras have themselves stated that they have no intention of taking up this extreme position.

Madras paragraphs 29 & 34.

117. It has thus been shown that the disturbance in the incidence and quantity of flow at the Cauvery Dam caused by the Mysore method of measurement is quite of an insignificant character.

118. In considering the merits of any mode of measurement, whether advanced by Mysore or Madras, two important facts have to be borne in mind—

(a) the requirements of the delta irrigation should be duly provided for; and

(b) full facilities should be given to Mysore for impounding the excess waters in the proposed Mysore Reservoir.

On the one hand, if any system merely advocates that the delta irrigation requirements alone should form the basis, irrespective of the quantity of water made available for storage, such a system cannot prove acceptable to Mysore. If, on the other hand, the securing of the storage facilities becomes the only object, apart from the prescriptive requirements of the delta irrigation, such a method will not be acceptable to Madras.

119. The point for consideration in the present enquiry is thus evidently to uphold a method which may be proved to avoid these two extremes. The method put forward by Mysore has been shown to fulfil all the legitimate requirements of Madras with very insignificant disturbances confined to a very few days. It has been shown that even these little disturbances are immediately remedied, either by the useful surplus derived from the natural flow or from the compensation water provided for in the rules. It is on this account claimed that this system fully satisfies all the requirements of Madras irrigation, while the second condition, namely, the affording of full facilities for storage by Mysore has also been secured.

120. Any reservoir, large or small, must disturb the flow at the Cauvary Dam. The Agreement of 1892 contemplates such reservoirs and binds down Madras not to refuse consent to the same if, on fair and reasonable considerations, it is not found to interfere with their prescriptive rights. This fact deserves to be prominently kept in view in arriving at an amicable conclusion in this matter.

Appendix Q.

Brief Notes on Cases quoted by Madras.

1. Quoted to show that "riparian rights" theory is not unknown to international law and to refute the claim of an unlimited natural right:—The passages quoted in this paragraph are not of any significance in connection with this dispute, as the controversy is, as already stated, to be decided solely under the terms of the Agreement of 1892, and Mysore do not wish to base their claim on unlimited natural right.

Madras paragraph 14.
Farnham on 'Water and Water rights,' Sections 6, 8; Harvard Law Review, page 144; 1 Wharton's International Law Digest, Section 20.

2. Quoted with reference to the argument of permissive user. Not relevant since the argument is not urged by Mysore now.

Madras paragraph 15.
Perumal *v.* Ramasami, I. L. R. 11 Madras 16.

3. These contain a statement of the law regarding riparian rights as between private individuals. But such rules cannot obviously be extended, without agreement, to dealings between States and the Agreement of 1892 does not make any reference to them.

Madras paragraph 16.
Debi Pershad *v.* Joynath Singh, I.L.R. 24 Cal. 865, P.C. and Embrey *v.* Owen, 6 Exch. 353.

4. The case does not refer to the Easements Act as it was decided before that act was enacted, but to the provisions about prescription in the Limitation Act of 1871. The *dictum* laid down that the act does not exclude other modes of acquisition is quite just, but we are concerned in this case only with the question of protecting "prescriptive" rights.

Madras paragraph 20.
Rajrup Koer *v.* Abdul Hossein, I. L. R. 6 Cal. 394.

5. It is not denied that, prior to the enacting of the Statute Law, the principles of English law of prescription used to be referred to whenever necessary.

Madras paragraph 20.
Ponnusami Tevar *v.* Collector of Trichinopoly, 5 M.H.C.R. 6.

6. Quoted to show that, even if the Statutory Law of prescription is applicable, prior enjoyment will be regarded as continuing even in the absence of *user*, unless there was an interruption. This case will not support so broad a proposition. All that it decides is that, if the suit is brought within two years of interruption, it is sustainable, though actual *user* within two years prior to suit is not proved provided there has been *enjoyment of the right* within such period. The case before them involved a right which could be used only for 2 or 3 months in a year and even that, when the defendent's lands were flooded. That no broad rule was laid down in this case is shown in *26 Cal. page 597*, wherein Their Lordships in reference to this case state: "No rule was or could be laid down as to what would or would not constitute a continuance of the enjoyment as of right when there was no exercise of it for a given period and obviously that must depend upon the circumstances of each case and the nature of the right claimed."

Madras paragraph 20.
Kylays Chunder *v.* Sonatun Chung, 7 Cal. 132.

7. This is also cited as an authority for the proposition referred to above but Their Lordships on page 598 state: "At whatever time the suit is brought, the enjoyment must be found to have continued till within two years of the suit and if that cannot be found, the claim fails." The claim to easement was rejected by Their Lordships as the claimant had not exercised it for three years prior to suit.

Madras paragraph 20.
Janhavi Chowdhurani *v.* Bindu Bashini, I. L. R. 26 Calcutta 593.

8. It is pertinent to note here that, under the English Prescription Act, the claimant of an easement in order to satisfy the length of enjoyment required by the statute is bound to show some act of *user* within one year of action.

Cf. Parker *v.* Mitchell, 11 A. & E. 788.
Lowe *v.* Carpenter, 1851, 6 Ex. 825.
(Pages 455-456, Peacock on Easements, 2nd Edition.)

9. This is a peculiar case depending upon the combination of Roman Dutch law and English law and is not applicable to cases of statutory prescription under which the enjoyment of the right must be within a definite period from date of suit. In this dispute, we contend that subsequent acts of Madras do amount to an abandonment or surrender of the additional one foot flow at the Upper Anikat.

Madras paragraph 25.
Commissioner of French Hock *v.* Hugo, L. R. 10 App. Cases 336.

10. Quoted to show that abandonment cannot be presumed from the mere fact of non-user *of the same quantity since.* This is an old case of 1852. It cannot certainly be law where the Easements Act has to be applied; nor would it be sound law where the prescriptive provisions of a specific statute (such as Limitation Act) have to be applied analogically as we contend in this case. Moreover, the English case relates to a right of way which was not used as there was a more convenient way. But the expression "of the same quantity" introduced into paragraph 27 of the Madras case raises the question of the *extent* of the right.

Madras paragraph 27.
Ward *v.* Ward, 7 Exch. 86, Revised Reports.

11. These cases are quoted to show that discontinuance does not extinguish an easement unless release could be inferred. The first two relate to rights of way and the last to right to water. These cases would be relevant if the *right* alone were in dispute and not the *extent* of the right. The Madras case does not seem to make this distinction always. Madras practically seek to prove that the extent of its right should be the *maximum* quantity enjoyed at a particular time and not the varying quantities enjoyed at different intervals during the prescriptive period. These cases do not support such an extreme proposition.

Madras paragraphs 27 & 28.
James *v.* Stevenson, 1893, Appellate Cases, 162. Kristodhone Mitter *v.* Nandarini, I. L. R. 35 Calcutta, 889. Hale *v.* Oldroyd (1845), 14 M. & W. 789.

12. *Re* argument based on joint possession. This argument is not raised now by Mysore and therefore the cases need not be considered.

14 M. L. J. 350.
L. R. 10 Ch. Ap. 283.

13. Madras admit that it is laid down in the authorities that the measure of a prescriptive right is the extent of user and that the further question arises "how is the extent of user to be measured." It is also stated that the true principle of measurement is indicated in Section 28 of the Easements Act according to which the intention of the parties and the purpose for which it was acquired should be taken into account (paragraph 32). For what purpose then did Madras acquire prescriptive right and what was their intention? Surely, it is for the purpose of irrigation and not to preserve a particular level of flow as a piece of natural scenery. This is admitted by Madras (*vide* paragraph 13 Madras Legal Rejoinder). A convenient way of measuring prescriptive right to water for irrigation is to ascertain the area for which the water was used. The passages quoted by Madras from Doss, Angell and Farnham, doubtless show that, once a right has been acquired, a change in the mode and objects of exercising it is justifiable to a certain extent. But these authorities are not useful for the purpose in view, inasmuch as they throw no light at all on the question enunciated by Madras itself "how is the *extent* of user to be measured." The Mysore answer to this query is that the area irrigated ought to be the chief criterion in determining the extent of the right. No authority is cited by Madras to show why this view is untenable.

Madras paragraphs 32 to 35.
Doss on Riparian Rights, 324
Angell on Water Courses, para 230. Farnham on Waters, Sec. 542.

14. These cases are quoted to show that no interruption due to seasons or natural causes brings about a breach of continuity so as to take away the right itself. This is not the argument used by Mysore. The contention of Mysore is that, in determining the extent of the user, the varying quantities of water used by Madras for the necessarily varying needs of irrigation ought to be taken into account. The cases quoted by Madras have little or no bearing on this aspect of the case.

Madras paragraph 41.
Simpson *v.* Corporation of Godmanchester, L. R. 1897 Ap. Cases, 696.
Hall *v.* Swift, 4 Bing. N. C. 381.
Angell on Water Courses, Sec. 211.
11 Madras 18. 30 Cal. 1077. 8 Cal. W. Notes 158. 13 Cal. L. J. 670.

15. Mysore concede that a change in the mode of using a right is no doubt permissible under certain conditions ; but the contention of Mysore has been that the effect of the remodelling of the anikat was to abandon the right to one foot flow over the Upper Anikat if it amounted to a right of easement and that such a right was only a dependent one. From the Mysore point of view these two cases are inapplicable as the question is not one of change of user merely, but is a question of *abandonment* of the right itself.

Madras paragraphs 44 and 45.
R. V. Tippet 13 Cal. 136.
3, B. and Ald. 193.

Statemen cusecs in the Cauvery and 6,100 cusecs in the Vennar.

F	1903-04	1904-05	1905-06	1906-07	1907-08	1908-09	1909-10	Remarks
	15	16	17	18	19	20	21	22
June ...	3629	7109	2573	688	1262	1551	11836	
	8254	16685	7656	3059	9981	4294	11871	
July ...	4384	20777	19692	4174	15028	16742	22395	
	24123	24019	18859	18331	14863	23583	24123	
August	21750	20261	17732	21923	22614	22615	21483	
-	23440	19184	15619	19301	30369	21181	20648	
September ...	16974	7674	16692	21308	21377	13092	19921	
	13716	15556	11718	16815	15166	5891	11803	
Total for S.	**116270**	**131265**	**110541**	**105599**	**130660**	**108949**	**144080**	
October ...	18186	10058	8412	16919	13720	7025	18478	
	23328	13524	8958	10554	11107	8802	20388	
November ...	20506	5377	2833	8957	3156	4855	13424	
	18204	1430	3776	2094	10708	1352	4811	
December ...	15650	652	2163	3531	3788	349	4560	
	9371	501	867	5979	5032	376	3415	
January ...	9546	389	537	3572	1671	9812	1805	
	5438	373	1088	1177	1895	2072	925	
Total for J	**120229**	**32304**	**27997**	**67183**	**51077**	**34643**	**67806**	
	236499	**163569**	**138573**	**172782**	**181737**	**143592**	**211886**	
Appendix G, Total I	224944	162033	158659	183140	197405	163995	221747	
Supply to Delta are including leroon	223146	128933	165265	185701	236777	177068	252337	
	247940	144248	183628	206334	263086	195632	280373	

Appendix G_1.

Statement of fortnightly discharges of the rivers Cauvery and Vennar limited to a discharge of 11,350 cusecs in the Cauvery and 6,100 cusecs in the Vennar.

Fortnights	1890-91	1891-92	1892-93	1893-94	1894-95	1895-96	1896-97	1897-98	1898-99	1899-00	1900-01	1901-02	1902-03	1903-04	1904-05	1905-06	1906-07	1907-08	1908-09	1909-10	Remarks
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
June ... 1st half ..	2864	5309	6077	12587	4055	946	1309	2733	3122	1185	1885	4060	595	3629	7109	2573	688	1262	1551	11836	
June ... 2nd half ...	8087	5127	9631	20765	15560	13504	14891	17641	19321	15719	15331	16999	7178	8254	16685	7656	3059	9981	4294	11871	
July ... 1st half ...	11854	14671	15060	17973	5710	21427	22248	16827	14267	20526	22615	17066	8406	4384	20777	19692	4174	15028	16742	22395	
July ... 2nd half ...	19354	20814	23863	17001	21638	23795	24123	24123	17276	14364	24122	24053	23492	24123	24019	18859	18331	14863	23583	24123	
August 1st half ...	22079	22494	22546	20813	20414	22614	22615	22614	22580	6237	22614	22122	18218	21750	20261	17732	21923	22614	22615	21483	
August 2nd half ...	18890	20150	22855	13884	24019	23950	24123	24123	16615	10448	24123	21970	11071	23440	19184	15619	19301	30369	21181	20648	
September ... 1st half ...	10931	16758	21602	19300	16546	13530	21630	22614	17216	16199	22248	11947	19256	16974	7674	16692	21308	21377	13092	19921	
September ... 2nd half ...	5521	8959	16355	13169	11536	12462	18582	22062	20765	17926	19819	18140	18789	13716	15556	11718	16815	15165	5891	11803	
Total for S. W. Monsoon ...	**99580**	**114282**	**137989**	**135492**	**119478**	**132228**	**149486**	**152737**	**131162**	**102604**	**152757**	**124915**	**107005**	**116270**	**131265**	**110541**	**105599**	**130660**	**108949**	**144080**	
October ... 1st half ...	12919	16437	16478	19201	4635	21803	20381	22580	22615	7170	16740	18737	15076	18186	10058	8412	16919	13720	7025	18478	
October ... 2nd half ...	9355	21231	19267	23812	19833	22187	12742	21669	22697	11581	18502	18266	14645	23328	13524	8958	10554	11107	8802	20388	
November ... 1st half ...	22287	15965	8570	15072	16317	19837	6295	15589	18149	4677	9478	13835	14177	20506	5377	2833	8957	3156	4855	13424	
November ... 2nd half ...	8925	7213	3184	20409	5903	6274	19293	9227	19001	970	5812	18082	10301	18204	1430	3776	2094	10708	1352	4811	
December ... 1st half ...	4868	2837	1763	10811	3716	3420	14663	8114	14727	803	2728	10079	11487	15650	652	2163	3531	3788	349	4560	
December ... 2nd half ...	3338	4900	1688	4309	1142	2611	14049	5311	10236	572	2714	5418	10044	9371	501	867	5979	5032	376	3415	
January ... 1st half ...	804	2353	994	2042	932	7597	5691	3048	7952	459	1557	6508	4692	9546	389	537	3572	1671	9812	1805	
January ... 2nd half ...	527	985	573	1317	625	1421	1541	2509	3033	580	1399	2626	2836	5438	373	1088	1177	1895	2072	925	
Total for N. E. Monsoon ...	**63023**	**71921**	**52517**	**96973**	**53103**	**85150**	**94655**	**83047**	**119010**	**26812**	**58940**	**93551**	**83258**	**120229**	**32304**	**27997**	**67183**	**51077**	**34643**	**67806**	
Grand Total ...	**162603**	**186203**	**190506**	**232465**	**172581**	**217378**	**244141**	**240784**	**250172**	**129416**	**211697**	**218501**	**190263**	**236499**	**163569**	**138573**	**172782**	**181737**	**143592**	**211886**	
Appendix G, Total for limits of rules ...	163431	175896	204940	225374	184354	210742	225999	220527	210491	132123	210753	219432	191965	224944	162033	158659	183140	197105	163995	221747	
Supply to Delta area... According to Sir John Benton's Note.	129078	128398	143184	179123	125501	164005	227560	205990	173508	117312	229671	204624	173109	223146	128933	165265	185701	236777	177068	252337	
„ including Coleroon ...	143420	142659	159093	199025	139445	182238	252845	228878	192775	129043	255190	227360	192343	247940	144248	183628	206334	263086	195632	280373	

Appendix K—1.

Month and date		Corresponding gauge reading at Cauvery Dam	Upper Anikat into Coleroon	Grand Anikat into Coleroon	Discharge through 150 yards Calingula	Total of Cols. 3, 4 and 5	Total discharge at Lower Anikat	Quantity due to leakage, etc., Col. 7—Col. 6	Lower Anikat into Coleroon	Net quantity used for irrigation, Col. 7—Col. 9	Quantity passed through Vadavar	Quantity required for direct irrigation 20 m. c. per day	Net flow to Veeranam tank, Col. 11—Col. 12	Level of Veeranam tank	Remarks
1		2	3	4	5	6	7	8	9	10	11	12	13	14	15
June 1899.	1	3·0	...	119	...	119	330	211	330	...	...	...	...		
	2	2·7	...	119	...	119	324	205	324	...	...	...	...		
	3	2·6	...	112	...	112	315	203	315	...	...	...	...		
	4	2·5	...	108	...	108	296	188	294	...	...	...	...		
	5	2·7	...	107	...	107	287	180	287	...	...	...	...		
	6	2·8	...	112	...	112	284	172	284	...	...	...	...		
	7	2·7	...	109	...	109	289	180	289	...	...	...	...		
	8	2·6	...	103	...	103	302	199	302	...	...	...	...		
	9	2·5	...	98	...	98	313	215	313	...	...	...	...	Nil.	
	10	2·7	...	103	...	103	299	196	299	...	...	...	...		
	11	2·8	...	109	...	109	306	197	206	...	...	...	...		
	12	2·8	...	113	...	113	303	190	303	...	...	...	...		
	13	2·6	...	108	...	108	299	191	299	...	...	...	...		
	14	2·4	...	103	...	103	114	11	114	...	...	...	...		
	15	2·3	...	45	...	45	112	67	111	1	...	...	...		
	Total	...	...	1,568	...	1,568	4,173	2,605	4,172	1	...	...	...	...	
	16	2·2	...	...	...	...	...	...	...	...	...	...	...		
	17	4·4	...	...	...	...	...	...	...	...	...	...	...		
	18	4·8	...	...	...	...	...	...	...	...	...	...	...		
	19	8·2	2,212	160	280	2,652	145	...	82	63	...	...	...		
	20	8·6	2,833	1,501	337	4,671	4,771	100	1,898	2,873	49	20	29	Nil.	
	21	8·8	3,145	1,368	360	4,873	3,944	...	2,481	1,463	102	20	82		
	22	8·2	2,212	343	280	2,835	2,593	...	1,549	1,044	101	20	81		
	23	7·3	1,054	...	168	1,222	1,745	523	1,667	78	77	20	57		
	24	6·5	345	...	89	434	254	...	105	149	55	20	35		
	25	5·9	79	...	36	115	324	209	180	144	50	20	30		
	26	5·3	...	...	...	...	177	177	91	86	45	20	25		
	27	4·9	...	...	...	...	151	151	79	72	38	20	18	38·89	
	28	4·5	...	...	...	...	103	103	52	51	38	20	18		
	29	4·3	...	...	...	...	63	63	19	44	34	20	14		
	30	4·0	...	...	...	...	35	35	...	35	19	19	...		
Total ...		...	11,880	3,372	1,550	16,802	14,305	1,361	8,203	6,102	608	219	389	...	
Monthly Total		...	11,880	4,940	1,550	18,370	18,478	3,966	12,375	6,103	608	219	389	...	

APPENDIX K—1—*contd.*

Month and date	Corresponding gauge reading at Cauvery Dam	Upper Anikat into Coleroon	Grand Anikat into Coleroon	Discharge through 150 yards Calingula	Total of Cols. 3, 4 and 5	Total discharge at Lower Anikat	Quantity due to leakage, etc., Col. 7—Col. 6	Lower Anikat into Coleroon	Net quantity used for irrigation, Col. 7—Col. 9	Quantity passed through Vadavar	Quantity required for direct irrigation 20 m. c. per day	Net flow to Veeranam tank, Col. 11—Col. 12	Level of Veeranam tank	Remarks
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
July 1899. 1	3·8	...	...	...	...	54	54	41	13	21	20	1		
2	3·9	...	...	...	...	37	37	24	13	17	17	...		
3	6·7	483	...	108	591	72	...	49	23	22	20	2		
4	8·2	2,212	122	280	2,614	1,633	...	1,508	125	78	20	58	40·59	
5	8·6	2,833	1,633	337	4,803	3,716	...	3,579	137	100	20	80		
6	8·4	2,523	1,340	305	4,168	3,373	...	3,240	133	96	20	76		
7	8·3	2,367	990	292	3,649	2,918	...	2,791	127	90	20	70		
8	8·0	1,901	220	252	2,373	2,075	...	1,966	109	84	20	64		
9	7·5	1,296	...	191	1,487	1,229	...	1,140	89	53	20	33		
10	7·1	812	...	147	959	769	...	676	93	53	20	33		
11	6·7	483	...	108	591	727	136	636	91	48	20	28		
12	6·5	345	...	89	434	570	136	476	94	48	20	28	41·29	
13	6·9	623	...	128	751	714	...	616	98	49	20	29		
14	7·3	1,054	...	168	1,222	1,094	...	986	108	61	20	41		
15	6·9	623	...	128	751	760	9	661	99	53	20	33		
Total	...	17,555	4,305	2,533	24,393	19,741	372	18,389	1,352	873	297	576	...	
16	6·5	138	...	89	434	592	158	496	96	47	20	27		
17	6·1	14	...	55	193	393	200	303	90	39	20	19		
18	5·7	...	...	21	35	227	192	145	82	33	20	13		
19	5·5	...	...	3	3	158	155	77	81	31	20	11		
20	5·2	...	...	...	...	101	101	38	63	24	20	4	42·19	
21	5·1	...	...	...	...	103	103	19	84	19	19	...		
22	5·0	...	...	...	...	103	103	...	103	49	20	29		
23	4·9	...	...	...	...	43	43	...	43	7	7	...		
24	4·6	...	...	...	...	49	49	...	49	6	6	...		
25	4·4	...	...	...	...	41	41	...	41	4	4	...		
26	4·1	...	...	...	...	32	32	...	32	4	4	...		
27	4·0	...	...	...	...	33	33	...	33	...	...	...		
28	4·0	...	...	...	...	32	32	...	32	..	...	...	41·89	
29	3·9	...	...	...	...	43	43	...	43	...	...	...		
30	3·9	...	...	...	...	33	33	...	33	...	...	...		
31	3·7	...	...	...	...	35	35	...	35	...	...	...		
Total ...	...	497	...	168	665	2,018	1,353	1,078	940	263	160	103	...	
Monthly Total	...	18,052	4,305	2,721	25,058	21,759	1,725	19,467	2,292	1,136	620	679	...	

APPENDIX K—1—*contd.*

Month and date		Corresponding gauge reading at Cauvery Dam	Upper Anikat into Coleroon	Grand Anikat into Coleroon	Discharge through 150 yards Calingula	Total of Cols. 3, 4 and 5	Total discharge at Lower Anikat	Quantity due to leakage, etc., Col. 7—Col. 6	Lower Anikat in Coleroon	Net quantity used for irrigation, Col. 7—Col. 9	Quantity passed through Vadavar	Quantity required for direct irrigation 20 m. c. per day	Net flow to Veeranam tank, Col. 11—Col. 12	Level of Veeranam tank	Remarks
1		2	3	4	5	6	7	8	9	10	11	12	13	14	15
August 1899.	1	3·6	...	...	...	...	33	33	...	33	...	...	...		
	2	3·7	...	...	...	...	29	29	...	29	...	...	...		
	3	4·2	...	...	...	...	24	24	...	24	...	...	...		
	4	3·7	...	...	...	...	14	14	...	14	13	13	...	39·69	
	5	3·4	...	...	...	...	36	36	...	36	19	19	...		
	6	3·3	...	...	...	...	39	39	...	39	...	...	...		
	7	3·1	...	...	...	...	24	24	...	24	...	...	...		
	8	3·0	...	...	...	...	24	24	...	24	...	...	...		
	9	2·8	...	...	...	...	24	24	...	24	...	...	...		
	10	2·7	...	...	...	...	20	20	...	20	...	...	...		
	11	2·5	...	...	...	...	15	15	...	15	15	15	...	38·79	
	12	2·1	...	...	...	...	10	10	...	10	13	13	...		
	13	2·0	...	...	...	...	27	27	...	27	...	...	...		
	14	2·0	...	...	...	...	20	20	...	20	...	...	...		
	15	6·3	239	...	70	309	20	...	...	20	...	...	...		
	Total	...	239	...	70	309	359	339	...	359	60	60	...	...	
	16	5·8	62	...	30	92	114	22	26	88	24	20	4		
	17	5·4	...	...	...	...	114	114	26	88	24	20	4		
	18	5·2	...	...	...	...	63	63	...	63	11	11	...		
	19	4·9	...	...	...	...	49	49	...	49	4	4	...		
	20	4·6	...	...	...	...	60	60	...	60	8	8	...		
	21	4·4	...	...	...	...	64	64	...	64	10	10	...		
	22	4·2	...	...	...	...	68	68	...	68	11	11	...		
	23	4·0	...	...	...	...	75	75	...	75	14	14	...		
	24	3·8	...	...	...	...	56	56	...	56	...	...	...	Nil.	
	25	3·7	...	...	...	...	64	64	...	64	7	7	...		
	26	3·6	...	...	...	...	48	48	...	48	4	4	...		
	27	3·3	...	...	...	...	20	20	...	20	15	15	...		
	28	3·3	...	...	...	...	39	39	...	39	7	7	...		
	29	3·3	...	...	...	...	25	25	...	25	...	...	...		
	30	3·1	...	...	...	...	23	23	...	23	...	...	...		
	31	3·7	...	...	...	...	42	42	...	42	5	5	...		
Total ...		...	62	...	30	92	924	832	52	872	144	320	8	...	
Monthly Total		...	301	...	100	401	1,283	1,171	52	1,231	204	620	8	...	

APPENDIX K—1—*contd.*

Month and date		Corresponding gauge reading at Cauvery Dam	Upper Anikat into Coleroon	Grand Anikat into Coleroon	Discharge through 150 yards, Calingula	Total of Cols. 3, 4 and 5	Total discharge at Lower Anikat	Quantity due to leakage, etc., Col. 7—Col. 6	Lower Anikat into Coleroon	Net quantity used for irrigation, Col. 7—Col. 6	Quantity passed through Vadavar	Quantity required for direct irrigation 20 m. c. per day	Net flow to Veeranam tank, Col. 11—Col. 12	Level of Veeranam tank	Remarks
1		2	3	4	5	6	7	8	9	10	11	12	13	14	15
September 1899.	1	3·9	...	...	...	...	15	15	...	15	15	15	...		
	2	3·9	...	...	...	...	63	63	...	63	6	6	...		
	3	3·8	...	...	...	...	34	34	...	34	...	...	...		
	4	4·3	...	...	...	...	40	40	...	40	...	...	...	Nil.	
	5	4·3	...	...	...	...	304	304	177	127	33	20	13		
	6	4·5	...	...	...	...	360	360	263	97	39	20	19		
	7	6·6	415	...	99	514	287	...	190	97	36	20	16		
	8	5·9	79	...	36	115	507	392	390	117	38	20	18		
	9	6·9	623	...	128	751	491	...	377	114	38	20	18		
	10	6·5	345	...	89	434	530	96	418	112	38	20	18		
	11	6·1	138	...	55	193	383	170	277	106	39	20	19		
	12	6·2	189	...	63	252	465	213	351	114	41	20	21	38·59	
	13	6·1	138	...	55	193	315	122	212	103	37	20	17		
	14	5·6	...	...	12	12	250	238	150	100	33	20	13		
	15	5·5	...	...	3	3	158	155	67	91	25	20	5		
	Total	...	1,927	...	540	2,467	4,202	2,222	2,872	1,330	418	241	177	...	
	16	5·2	...	...	...	...	172	172	78	94	30	20	10		
	17	5·1	...	...	...	...	253	253	150	103	33	20	13		
	18	5·2	...	...	...	...	199	199	101	98	31	20	11		
	19	7·0	689	...	135	824	274	...	170	104	33	20	13		
	20	7·7	1,542	...	215	1,757	1,493	...	1,347	146	73	20	53	40·29	
	21	6·8	553	...	120	673	943	270	838	105	52	20	32		
	22	7·1	812	...	147	959	648	...	596	52	48	20	28		
	23	7·4	1,175	...	180	1,355	1,227	...	1,092	135	66	20	46		
	24	6·4	294	...	85	379	842	463	721	121	47	20	27		
	25	5·8	62	...	30	92	354	262	263	91	37	20	17		
	26	5·4	...	...	...	...	215	215	116	99	33	20	13		
	27	5·0	...	...	...	...	138	138	52	86	25	20	5	40·09	
	28	4·7	...	...	...	...	130	130	64	66	30	20	10		
	29	4·4	...	...	...	...	124	124	52	72	24	20	4		
	30	4·1	...	...	...	...	72	72	...	72	17	17	...		
Total ...		...	5,127	...	912	6,039	7,084	2,298	5,640	1,444	579	297	282	...	
Monthly Total		...	7,054	...	1,452	8,506	11,286	4,520	8,512	2,774	997	538	469	...	

APPENDIX K—1—*contd.*

Month and date		Corresponding gauge reading at Cauvery Dam	Upper Anikat into Coleroon	Grand Anikat into Coleroon	Discharge through 150 yards Calingulu	Total of Cols. 3, 4 and 5	Total discharge at Lower Anikat	Quantity due to leakage, etc., Col. 7—Col. 6	Lower Anikat into Coleroon	Net quantity used for irrigation, Col. 7—Col. 9	Quantity passed through Vadavar	Quantity required for direct irrigation 20 m. c. per day	Net flow to Veeranam tank, Col. 11—Col. 12	Level of Veeranam tank	Remarks
1		2	3	4	5	6	7	8	9	10	11	12	13	14	15
October 1899.	1	3·8	...	...	...	...	52	52	...	52	7	7	...		
	2	3·9	...	...	...	...	47	47	...	47	4	4	...		
	3	3·7	...	...	...	...	46	46	...	46	4	4	...		
	4	3·6	...	...	...	...	56	56	...	56	4	4	...	39·89	
	5	3·5	...	...	...	...	51	51	...	51	4	4	...		
	6	3·7	...	...	...	...	46	46	...	46	...	...	...		
	7	3·7	...	...	...	...	45	45	...	45	...	...	...		
	8	3·7	...	...	...	...	45	45	...	45	...	...	...		
	9	3·5	...	...	...	...	45	45	...	45	...	...	...		
	10	3·3	...	...	...	...	48	48	...	48	...	...	...		
	11	3·2	...	...	...	...	63	63	...	63	8	8	...		
	12	3·2	...	...	...	...	74	74	...	74	15	15	...	38·79	
	13	4·3	...	...	...	...	62	62	...	62	9	9	...		
	14	3·9	...	...	...	...	55	55	...	55	6	6	...		
	15	3·8	...	...	...	...	86	86	...	86	24	20	4		
	Total	...	...	...	...	...	821	821	...	821	85	81	4	...	
	16	4·4	...	...	...	...	118	118	32	86	24	20	...		
	17	4·5	...	...	...	...	86	86	6	80	20	20	...		
	18	4·5	...	...	...	...	76	76	...	76	19	19	...		
	19	4·5	...	...	...	...	110	110	78	32	31	20	11		
	20	4·4	...	...	...	...	354	354	251	103	37	20	17	38·09	
	21	4·2	...	...	...	...	314	314	272	42	37	20	17		
	22	4·3	...	...	...	...	335	335	1,236	...	38	20	18		
	23	4·2	...	...	...	...	1,469	1,469	1,374	95	76	20	56		
	24	3·9	...	...	...	...	1,626	1,626	1,560	66	52	20	32		
	25	4·0	...	...	...	...	758	758	725	33	32	20	12		
	26	4·1	...	...	...	...	403	403	393	10	8	8	...		
	27	3·9	...	...	...	...	11	11	...	11	11	11	...		
	28	4·6	...	...	...	...	108	108	78	30	30	20	10	C 44·79	
	29	4·5	...	...	...	...	56	56	32	24	24	20	4		
	30	4·3	...	...	...	...	76	76	52	24	33	20	13		
	31	4·0	...	...	...	...	104	104	52	52	25	20	5		
Total ...		...	...	...	...	...	6,004	6,004	6,141	764	497	298	199	...	
Monthly Total		...	...	...	...	...	6,825	6,825	6,141	1,585	582	379	203	...	

APPENDIX K—1—*contd.*

Month and date	Corresponding gauge reading at Cauvery Dam	Upper Anikat into Coleroon	Grand Anikat into Coleroon	Discharge through 150 yards Calingula	Total of Cols. 3, 4 and 5	Total discharge at Lower Anikat	Quantity due to leakage, etc., Col. 7—Col. 6	Lower Anikat into Coleroon	Net quantity used for irrigation, Col. 7—Col. 9	Quantity passed through Vadavar	Quantity required for direct irrigation 20 m. c. per day	Net flow to Veeranam tank, Col. 11—Col. 12	Level of Veeranam tank	Remarks
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
November 1899. 1	3·7	...	...	...	...	127	127	64	63	17	17	...		
2	3·6	...	...	...	...	159	159	90	69	20	20	...		
3	3·5	...	...	...	...	113	113	38	75	25	20	5		
4	3·4	...	...	...	...	75	75	6	69	22	20	2	C 44·69	
5	3·3	...	...	...	...	89	89	...	59	14	14	...		
6	3·6	...	...	...	...	50	50	...	50	10	10	...		
7	3·3	...	...	...	...	46	46	...	46	11	11	...		
8	3·0	...	...	...	...	50	50	...	50	10	10	...		
9	2·9	...	...	...	...	40	40	...	40	13	13	...		
10	2·8	...	...	...	...	34	34	6	28	22	20	2		
11	2·7	...	...	...	...	45	45	...	45	14	14	...	C 43·89	
12	2·7	...	...	...	...	39	39	...	39	6	6	...		
13	2·7	...	...	...	...	54	54	...	54	6	6	...		
14	2·7	...	...	...	...	33	33	...	33	...	...	...		
15	2·7	...	...	...	...	32	32	...	32	...	...	...		
Total	...	...	...	...	...	956	956	204	752	190	181	9	...	
16	2·7	...	...	...	...	48	48	...	48	4	4	...		
17	2·3	...	...	...	...	24	24	...	24	19	19	...		
18	2·0	...	...	...	...	51	51	...	51	7	7	...		
19	2·0	...	...	...	...	46	46	...	46	...	...	...	C 43·29	
20	1·8	...	...	...	...	23	23	...	23	...	...	...		
21	1·3	...	...	...	...	20	20	...	20	...	...	...		
22	0·7	...	...	...	...	19	19	...	19	...	...	...		
23	0·7	...	...	...	...	37	37	...	37	...	...	...		
24	0·7	...	...	...	...	8	8	...	8	9	9	...		
25	0·7	...	...	...	...	52	52	...	52	5	5	...		
26	0·6	...	...	...	...	21	21	...	21	...	...	...		
27	0·6	...	...	...	...	10	10	...	10	...	...	...		
28	0·6	...	...	...	...	17	17	...	17	...	...	...	41·79	
29	0·6	...	...	...	...	18	18	...	18	...	...	...		
30	0·6	...	...	...	...	33	33	...	33	...	...	...		
Total ...	...	...	...	...	...	427	427	Nil.	427	44	44	Nil.	...	
Monthly Total	...	...	...	...	...	1,383	1,383	204	1,179	234	225	9	...	

Month and date		Corresponding gauge reading at Cauvery Dam	Upper Anikat into Coleroon.	Grand Anikat into Coleroon	Discharge through 160 yards Calingula	Total of Cols. 3, 4 and 5	Total discharge at Lower Anikat	Quantity due to leakage, etc., Col. 7—Col. 6	Lower Anikat into Coleroon	Net quantity used for irrigation, Col. 7—Col. 9	Quantity passed through Vadavar	Quantity required for direct irrigation 20 m. c. per day	Net flow to Veeranam tank, Col. 11—Col. 12	Level of Veeranam tank	Remarks
1		2	3	4	5	6	7	8	9	10	11	12	13	14	15
December 1899.	1	0·7	...	...	...	...	146	146	78	68	24	20	4		
	2	0·8	...	...	...	...	53	53	...	53	7	7	...		
	3	0·8	...	...	...	...	35	35	...	35	...	...	...		
	4	0·8	...	...	...	...	30	30	...	30	...	...	...	40·29	
	5	0·9	...	...	...	...	20	20	...	20	...	...	...		
	6	1·5	...	...	...	...	17	17	...	17	...	...	...		
	7	1·2	...	...	...	...	46	46	...	46	...	...	...		
	8	1·0	...	...	...	...	11	11	...	11	11	11	...		
	9	1·5	...	...	...	...	47	47	...	47	4	4	...		
	10	1·5	...	...	...	...	25	25	...	25	...	...	...		
	11	1·0	...	...	...	...	33	33	...	33	...	...	...		
	12	1·0	...	...	...	...	32	32	...	32	...	...	...	40·59	
	13	0·9	...	...	...	...	32	32	...	32	...	...	...		
	14	0·9	...	...	...	...	51	51	...	51	...	...	...		
	15	0·8	...	...	...	...	13	13	...	13	13	13	...		
	Total	...	...	...	...	...	591	591	78	513	59	55	4	...	
	16	0·8	...	...	...	...	31	31	...	31	4	4	...		
	17	0·8	...	...	...	...	20	20	...	20	...	...	...		
	18	0·7	...	...	...	...	19	19	...	19	...	...	...		
	19	0·7	...	...	...	...	20	20	...	20	...	...	...		
	20	0·7	...	...	...	...	18	18	...	18	...	...	...	39·79	
	21	0·7	...	...	...	...	34	34	...	34	...	...	...		
	22	0·6	...	...	...	...	4	4	...	4	4	4	...		
	23	0·6	...	...	...	...	25	25	...	25	...	...	...		
	24	0·6	...	...	...	...	6	6	...	6	...	...	...		
	25	0·6	...	...	...	...	14	14	...	14	...	...	...		
	26	0·7	...	...	...	...	16	16	...	16	...	...	...		
	27	0·7	...	...	...	...	13	13	...	13	...	...	...		
	28	0·7	...	...	...	...	16	16	...	16	...	...	...	38·19	
	29	0·6	...	...	...	...	18	18	...	18	...	...	...		
	30	0·6	...	...	...	...	5	5	...	5	...	...	...		
	31	0·6	...	...	...	...	5	5	...	5	...	...	...		
Total ...		...	...	...	...	...	264	264	...	264	8	8	...	...	
Monthly Total		...	...	...	...	...	855	855	78	777	67	63	4	...	

APPENDIX K—1—*contd.*

Month and date		Corresponding gauge reading at Cauvery Dam	Upper Anikat into Coleroon	Grand Anikat into Coleroon	Discharge through 150 yards Calingula	Total of Cols. 3, 4 and 5	Total discharge at Lower Anikat	Quantity due to leakage, etc., Col. 7—Col. 6	Lower Anikat into Coleroon	Net quantity used for irrigation, Col. 7—Col. 9	Quantity passed through Vadavar	Quantity required for direct irrigation 20 m. c. per day	Net flow to Veeranam tank, Col. 11—Col. 12	Level of Veeranam tank	Remarks
1		2	3	4	5	6	7	8	9	10	11	12	13	14	15
January 1900.	1	0·6	...	...	...	...	5	5	...	5	...	...	...	Nil.	
	2	0·6	...	...	...	...	5	5	...	5	...	...	...		
	3	0·6	...	...	...	...	5	5	...	5	...	...	...		
	4	0·7	...	...	...	...	5	5	...	5	...	...	...		
	5	0·7	...	...	...	...	5	5	...	5	...	...	...		
	6	0·7	...	...	...	...	5	5	...	5	...	...	...		
	7	0·7	...	...	...	...	5	5	...	5	...	...	...		
	8	0·7	...	...	...	...	5	5	...	5	...	...	...		
	9	0·7	...	...	...	...	5	5	...	5	...	...	...		
	10	0·7	...	...	...	...	5	5	...	5	...	...	...		
	11	0·7	...	...	...	...	5	5	...	5	...	...	...		
	12	0·7	...	...	...	...	2	2	...	2	...	...	...		
	13	0·6	...	...	...	...	5	5	...	5	...	...	...		
	14	2·1	...	...	...	...	5	5	...	5	...	...	...		
	15	1·8	...	...	...	...	5	5	...	5	...	...	...		
	Total	...	...	...	...	...	72	72	...	72	...	...	...	...	
	16	1·5	...	...	...	...	5	5	...	5	...	...	...	Nil.	
	17	1·4	...	...	...	...	5	5	...	5	...	...	...		
	18	1·3	...	...	...	...	5	5	...	5	...	...	...		
	19	1·1	...	...	...	...	5	5	...	5	...	...	...		
	20	1·0	...	...	...	...	5	5	...	5	...	...	...		
	21	1·0	...	...	...	...	5	5	...	5	...	...	...		
	22	0·9	...	...	...	...	5	5	...	5	...	...	...		
	23	...	...	...	...	...	5	5	...	5	...	...	...		
	24	...	...	...	...	...	4	4	...	4	...	...	...		
	25	...	...	...	...	...	5	5	...	5	...	...	...		
	26	...	...	...	...	...	4	4	...	4	...	...	...		
	27	...	...	...	...	...	4	4	...	4	...	...	...		
	28	...	...	...	...	...	4	4	...	4	...	...	...		
	29	...	...	...	...	...	4	4	...	4	...	...	...		
	30	...	...	...	...	...	4	4	...	4	...	...	...		
	31	...	...	...	...	...	6	6	...	6	...	...	...		
Total ...		...	...	...	...	...	75	75	...	75	...	...	...	...	
Monthly Total		...	...	...	...	...	147	147	...	147	...	...	...	...	

Month and date		Corresponding gauge reading at Cauvery Dam	Upper Anikat into Coleroon	Grand Anikat into Coleroon	Discharge through 150 yards Culingula	Total of Cols. 3, 4 and 5	Total discharge at Lower Anikat	Quantity due to leakage, etc., Col. 7—Col. 6	Lower Anikat into Coleroon	Net quantity used for irrigation, Col. 7—Col. 9	Quantity passed through Vadavar	Quantity required for direct irrigation 20 m. c. per day	Net flow to Veeranam tank, Col. 11—Col. 12	Level of Veeranam tank	Remarks
1		2	3	4	5	6	7	8	9	10	11	12	13	14	15
June 1905.	1	3·2	...	...	...	...	485	485	484	1	...	..	...	.Nil	
	2	3·0	...	...	...	...	348	348	348	...	...	...	...		
	3	2·9	...	...	...	...	310	310	310	...	...	...	...		
	4	2·7	...	...	...	...	285	285	284	1	...	...	...		
	5	2·4	...	...	...	...	265	265	265	...	...	...	...		
	6	2·4	...	...	...	...	390	390	390	...	...	...	...		
	7	2·1	...	...	...	...	411	411	410	1	...	...	...		
	8	3·0	...	...	...	...	292	292	292	...	...	...	...		
	9	2·7	...	...	..	...	263	263	262	1	...	...	...		
	10	2·5	...	...	...	...	264	264	264	...	...	...	...		
	11	2·2	...	...	...	...	250	250	250	...	...	...	...		
	12	2·2	...	...	...	...	229	229	229	...	...	...	...		
	13	2·0	...	...	...	...	188	188	188	...	...	...	...		
	14	2·1	...	...	...	...	156	156	155	1	...	...	...		
	15	2·3	...	...	...	...	119	119	118	1	...	...	...		
	Total	...	...	...	...	...	4,255	4,255	4,249	6	...	...	...	...	
	16	2·0	...	...	...	...	119	119	116	3	...	...	...	Nil.	
	17	1·7	...	...	...	...	128	128	127	1	...	...	...		
	18	1·5	...	...	...	...	128	128	127	1	...	...	...		
	19	1·9	...	...	...	...	128	128	127	1	...	...	...		
	20	1·9	...	...	...	...	118	118	117	1	...	...	...		
	21	1·7	...	...	...	...	103	103	101	2	...	...	...		
	22	1·5	...	...	...	...	103	103	101	2	...	...	...		
	23	4·1	...	...	...	...	132	132	131	1	...	...	...		
	24	3·9	...	...	...	..	158	158	140	18	...	...	...		
	25	6·6	...	..	99	99	119	20	118	1	...	...	...		
	26	5·7	...	...	21	21	164	143	146	18	1	1	...		
	27	4·9	..	...	...	...	19	19	...	19	3	3	...		
	28	4·3	...	...	...	...	19	19	...	19	3	3	...		
	29	4·1	...	...	...	...	18	18	..	18	2	2	...		
	30	4·7	...	...	...	...	10	10	...	10	1	1	...		
Total ...		...	...	...	120	120	1,466	1,346	1,351	115	10	10	...	...	
Monthly Total		...	...	...	...	...	5,721	5,601	5,600	121	10	10	...	...	

APPENDIX K—1—*contd.*

Month and date	Corresponding gauge reading at Cauvery Dam	Upper Anikat into Coleroon	Grand Anikat into Coleroon	Discharge through 150 yards Calingula	Total of Cols. 3, 4 and 5	Total discharge at Lower Anikat	Quantity due to leakage, etc., Col. 7—Col. 6	Lower Anikat into Coleroon	Net quantity used for irrigation, Col. 7—Col. 9	Quantity passed through Vadavar	Quantity required for direct irrigation 20 m. c. per day	Net flow to Veeranam tank, Col. 11—Col. 12	Level of Veeranam tank	Remarks
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
July 1905. 1	6·2	...	77	63	140	42	...	...	42	38	20	18		
2	7·5	1,153	1,116	191	2,460	863	...	833	30	25	20	5		
3	7·4	1,135	815	180	2,130	2,459	329	2,376	83	76	20	56		
4	7·5	1,205	1,486	191	2,882	2,049	...	1,908	141	76	20	56	Nil.	
5	7·5	1,056	1,148	191	2,395	1,987	...	1,858	129	76	20	56		
6	7·4	254	976	180	1,410	1,392	...	1,197	195	76	20	56		
7	6·6	...	501	99	600	715	115	583	132	76	20	56		
8	5·8	...	...	30	30	846	816	519	327	76	20	56		
9	5·0	...	...	...	...	157	157	...	157	73	20	53		
10	4·5	...	...	...	...	131	131	...	131	47	20	27		
11	4·5	...	...	...	...	101	101	...	101	25	20	5	38·79	
12	7·0	1,777	551	135	2,463	1,807	...	926	881	39	20	19		
13	7·5	511	702	191	1,404	2,094	690	933	161	76	20	56		
14	6·8	...	361	120	481	226	...	65	161	76	20	56		
15	6·0	...	...	42	42	165	123	...	165	74	20	54		
Total	...	7,091	7,733	1,613	16,437	15,034	2,462	12,198	2,836	929	300	629	...	
16	5·4	...	...	...	...	143	143	...	143	54	20	34		
17	4·8	...	...	...	...	125	125	...	125	40	20	20		
18	4·2	...	...	...	...	83	83	...	83	5	5	...		
19	3·9	...	...	...	...	68	68	...	68	1	1	...	41·49	
20	3·6	...	...	...	...	61	61	...	61	...	...	...		
21	3·8	...	...	...	...	70	70	...	70	...	...	...		
22	4·2	...	...	...	...	68	68	...	68	...	...	...		
23	7·0	1,357	328	135	1,820	92	...	...	92	41	20	21		
24	8·8	3,872	1,894	360	6,166	9,139	3,013	8,949	190	97	20	77		
25	9·2	3,891	2,481	410	6,782	10,253	3,471	9,156	1,097	109	20	89		
26	9·3	3,951	2,842	425	7,218	9,780	2,562	8,693	1,087	104	20	84		
27	8·6	3,028	2,008	337	5,373	6,424	1,051	6,229	195	86	20	66	41·19	
28	7·7	1,866	1,283	215	3,364	3,661	297	3,548	113	76	20	56		
29	7·0	2,285	306	135	2,726	3,080	354	2,739	341	76	20	56		
30	7·0	1,833	...	135	1,968	2,147	170	1,948	199	76	20	56		
31	7·0	1,833	...	135	1,968	1,968	...	1,769	199	76	20	56		
Total ...	...	23,916	11,142	2,278	37,345	47,162	11,445	43,031	4,131	841	526	615	...	
Monthly Total	...	31,007	18,875	3,891	53,782	62,196	13,907	55,229	6,967	1,770	226	1,244	...	

Appendix K—1—*contd.*

Month and date		Corresponding gauge reading at Cauvery Dam	Upper Anikat into Coleroon	Grand Anikat into Coleroon	Discharge through 150 yards Culingula	Total of Cols. 3, 4 and 5	Total discharge at Lower Anikat	Quantity due to leakage, etc., Col. 7—Col. 6	Lower Anikat into Coleroon	Net quantity used for irrigation, Col. 7—Col. 9	Quantity passed through Vadavar	Quantity required for direct irrigation 20 m. c. per day	Net flow to Veeranam tank, Col. 11—Col. 12	Level of Veeranam tank	Remarks
1		2	3	4	5	6	7	8	9	10	11	12	13	14	15
August 1905.	1	7·5	396	204	191	791	1,546	755	1,346	200	76	20	56		
	2	7·5	48	354	191	593	1,243	650	1,046	197	76	20	56		
	3	7·5	...	457	191	648	1,027	379	795	232	76	20	56		
	4	7·2	...	307	158	465	1,025	560	793	230	76	20	56	40·79	
	5	6·6	...	...	99	99	185	86	...	185	65	20	45		
	6	6·4	...	...	85	85	199	114	...	199	76	20	56		
	7	6·1	...	...	55	55	185	130	...	185	67	20	47		
	8	5·7	...	...	21	21	151	130	...	151	47	20	27		
	9	5·2	...	...	...	...	122	122	...	122	33	20	13		
	10	4·8	...	...	...	...	121	121	...	121	16	16	...		
	11	4·5	...	...	...	...	100	100	...	100	15	15	...	41·69	
	12	4·3	...	...	...	...	85	85	...	85	10	10	...		
	13	4·1	...	...	...	...	110	110	...	110	18	18	...		
	14	4·0	...	...	...	...	99	99	...	99	16	16	...		
	15	3·9	...	...	...	...	66	66	...	66	12	12	...		
	Total	...	444	1,322	991	2,757	6,264	3,507	3,982	2,282	679	267	412	...	
	16	3·8	...	...	...	...	85	85	...	85	10	10	...		
	17	4·1	...	...	...	...	90	90	...	90	10	10	...		
	18	4·6	...	...	...	...	160	160	...	160	67	20	47		
	19	4·2	...	...	...	...	113	113	...	113	46	20	26		
	20	3·9	...	...	...	...	109	109	...	109	35	20	15	41·69	
	21	3·8	...	...	...	...	129	129	...	129	42	20	22		
	22	4·4	...	...	...	...	98	98	...	98	16	16	...		
	23	4·9	...	...	...	...	63	63	...	63	4	4	...		
	24	5·4	...	...	...	...	58	58	...	58	2	2	...		
	25	5·4	...	...	...	...	47	47	...	47	2	2	...		
	26	5·4	...	...	...	...	78	78	...	78	4	4	...		
	27	5·3	...	...	...	...	34	34	...	34	24	20	4		
	28	5·4	...	...	...	...	115	115	...	115	23	20	3	43·49	
	29	5·5	...	...	3	3	166	163	...	166	63	20	43		
	30	5·8	...	...	30	30	134	104	...	134	42	20	22		
	31	5·8	...	...	30	30	163	133	...	163	59	20	39		
Total ...		...	...	...	63	63	1,642	1,579	...	1,642	449	495	221	...	
Monthly Total		...	444	1,322	1,054	2,820	7,907	5,086	3,982	3,924	1,120	228	633	...	

APPENDIX K—1—*contd.*

Month and date		Corresponding gauge reading at Cauvery Dam	Upper Anikat into Coleroon	Grand Anikat into Coleroon	Discharge through 150 yards Calingula	Total of Cols. 3, 4 and 5	Total discharge at Lower Anikat	Quantity due to leakage, etc., Col. 7—Col. 6	Lower Anikat into Coleroon	Net quantity used for irrigation, Col. 7—Col. 9	Quantity passed through Vadavar	Quantity required for direct irrigation 20 m. c. per day	Net flow to Veeranam tank, Col. 11—Col. 12	Level of Veeranam tank	Remarks
1		2	3	4	5	6	7	8	9	10	11	12	13	14	15
September 1905.	1	6·4	...	81	85	166	168	2	...	168	·76	20	56		
	2	6·4	...	195	85	280	148	...	...	148	76	20	56		
	3	6·5	...	330	89	419	990	571	837	153	76	20	56		
	4	6·5	...	642	89	731	722	...	571	151	76	20	56	42·79	
	5	5·5	...	...	3	3	513	510	402	111	76	20	56		
	6	4·9	...	318	...	318	137	...	...	137	76	20	56		
	7	4·8	...	416	...	416	479	63	332	147	76	20	56		
	8	4·7	...	294	...	294	283	...	131	152	76	20	56		
	9	4·6	...	73	...	73	177	104	...	177	76	20	56		
	10	4·7	...	...	...	...	176	176	...	176	54	20	34		
	11	5·0	536	418	...	954	128	...	...	128	31	20	11		
	12	5·0	1,320	151	...	2,471	648	...	459	189	76	20	56	C 43·89	
	13	6·0	464	529	42	1,035	544	...	399	145	76	20	56		
	14	6·0	168	731	42	941	908	...	657	251	76	20	56		
	15	5·8	...	292	30	322	448	126	263	185	76	20	56		
	Total	...	2,488	4,470	465	8,423	6,469	1,552	4,051	2,418	1,073	300	773	...	
	16	5·5	...	...	3	3	156	153	...	156	51	20	31		
	17	5·1	...	...	...	...	158	158	...	158	53	20	33		
	18	5·6	...	...	12	12	144	132	...	144	44	20	24		
	19	4·5	...	...	...	...	140	140	...	140	40	20	20		
	20	4·3	...	...	...	...	93	93	...	93	70	20	50	43·39	
	21	5·6	...	...	12	12	82	70	...	82	8	8	...		
	22	4·5	...	...	...	...	82	82	...	82	11	11	...		
	23	4·1	...	...	...	...	117	117	...	117	9	9	...		
	24	3·7	...	...	...	...	95	95	...	95	9	9	...		
	25	3·5	...	...	...	...	78	78	...	78	5	5	...		
	26	3·4	...	...	...	...	105	105	...	105	17	17	...		
	27	3·1	...	...	...	...	77	77	...	77	5	5	...		
	28	2·9	...	...	...	...	66	66	...	66	2	2	...	42·89	
	29	2·8	...	...	...	...	51	51	...	51	...	...	...		
	30	2·8	...	...	...	...	51	51	...	51	...	...	...		
Total ...		...	...	...	27	27	1,495	1,468	...	1,495	324	466	158	...	
Monthly Total		...	2,488	4,470	492	8,450	7,964	3,020	4,051	3,913	1,397	166	931	...	

APPENDIX K—1—*contd.*

Month and date		Corresponding gauge reading at Cauvery Dam	Upper Anikat into Coleroon	Grand Anikat into Coleroon	Discharge through 150 yards Calingula	Total of Cols. 3 4 and 5	Total discharge at Lower Anikat	Quantity due to leakage, etc., Col. 7—Col. 6	Lower Anikat into Coleroon	Net quantity used for irrigation, Col. 7—Col. 9	Quantity passed through Vadavar	Quantity required for direct irrigation 20 m. c. per day	Net flow to Veeranam tank, Col. 11—Col. 12	Level of Veeranam tank	Remarks
1		2	3	4	5	6	7	8	9	10	11	12	13	14	15
October 1905.	1	2'8	...	...	...	...	51	51	...	51	...	...	...	41'39	
	2	2'8	...	...	...	...	51	51	...	51	...	...	...		
	3	2'7	...	...	...	...	51	51	...	51	...	...	...		
	4	2'7	...	...	...	...	54	54	...	54	...	...	...		
	5	2'7	...	...	...	...	146	146	...	146	21	20	1		
	6	2'8	...	...	...	...	168	168	...	168	61	20	41		
	7	5'3	...	...	...	...	95	95	...	95	50	20	30		
	8	4'2	...	...	...	...	119	119	...	119	76	20	56		
	9	3'6	...	...	...	...	114	114	...	114	76	20	56		
	10	4'9	...	...	...	...	100	100	...	100	76	20	56		
	11	6'0	1,874	668	42	2,584	4,096	1,512	3,561	535	51	20	31	40'99	
	12	6'0	884	1,567	42	2,493	2,595	102	2,572	23	11	11	...		
	13	5'9	1,736	1,808	36	3,580	4,747	1,167	4,733	14	14	14	...		
	14	5'0	1,278	1,010	...	2,288	4,022	1,734	4,018	4	4	4	...		
	15	5'3	1,130	1,235	...	2,365	5,167	2,802	5,159	8	8	8	...		
	Total	...	6,902	6,288	120	13,310	21,576	8,266	20,043	1,533	448	177	271	...	
	16	7'1	2,759	2,217	147	5,123	7,064	1,941	7,002	62	61	20	41	C 44'39	
	17	6'3	2,241	1,829	70	4,140	5,658	1,518	5,623	35	35	20	15		
	18	6'3	2,232	1,645	70	3,947	4,946	999	4,925	21	21	20	1		
	19	6'6	2,372	1,756	99	4,227	4,801	574	4,728	73	18	18	...		
	20	5'8	1,656	1,431	30	3,117	3,769	652	3,717	52	7	7	...		
	21	5'0	1,405	1,077	...	2,482	2,759	277	2,746	13	1	1	...		
	22	4'5	1,696	740	...	2,436	2,070	...	2,027	43	...	...	...		
	23	5'0	148	601	...	749	1,904	1,155	1,845	59	...	...	...		
	24	5'0	...	...	...	...	2,073	2,073	1,954	119	31	20	11		
	25	4'7	...	...	...	...	1,737	1,737	...	1,737	76	20	56		
	26	4'3	...	...	...	...	168	168	...	168	64	20	44		
	27	4'0	...	...	...	...	146	146	...	146	47	20	27		
	28	3'8	...	...	...	...	112	112	...	112	26	20	6	C & D 43'99	
	29	3'5	...	...	...	...	86	86	...	86	11	11	...		
	30	3'3	...	...	...	...	80	80	...	80	6	6	...		
	31	3'2	...	...	...	...	66	66	...	66	4	4	...		
Total ...		...	14,509	11,296	416	26,221	38,439	11,584	34,567	2,872	408	384	201	...	
Monthly Total		...	21,411	17,584	536	39,531	60,015	19,850	54,610	4,405	856	207	472	...	

APPENDIX K—1—*contd.*

Month and date		Corresponding gauge reading at Cauvery Dam	Upper Anikat into Coleroon	Grand Anikat into Coleroon	Discharge through 150 yards Calingula	Total of Cols. 3, 4 and 5	Total discharge at Lower Anikat	Quantity due to leakage, etc., Col. 7—Col. 6	Lower Anikat into Coleroon	Net quantity used for irrigation, Col. 7—Col. 9	Quantity passed through Vadavar	Quantity required fordirectirrigation 20 m. c. per day	Net flow to Veeranam tank, Col. 11—Col. 12	Level of Veeranam tank	Remarks
1		2	3	4	5	6	7	8	9	10	11	12	13	14	15
November 1905.	1	3·0	...	...	...	...	62	62	...	62	4	4	...		
	2	2·9	...	...	...	...	58	58	...	58	3	3	...		
	3	2·8	...	...	...	...	58	58	...	58	2	2	...		
	4	2·7	...	...	...	...	58	58	...	58	1	1	...	42·79	
	5	2·6	...	...	...	...	63	63	...	53	1	1	...		
	6	2·1	...	...	...	...	58	58	...	58	1	1	...		
	7	2·4	...	...	...	...	58	58	...	58	1	1	...		
	8	2·2	...	...	...	...	68	68	...	58	4	4	...		
	9	2·2	...	...	...	...	129	129	...	129	72	20	52		
	10	2·2	...	...	...	...	134	134	...	134	76	20	56		
	11	2·2	...	...	...	...	129	129	...	129	72	20	52	40·29	
	12	2·2	...	...	...	...	120	120	...	120	59	20	39		
	13	2·3	...	...	...	...	96	96	...	96	48	20	28		
	14	3·2	...	...	...	...	85	85	...	85	42	20	22		
	15	2·7	...	...	...	...	63	63	...	63	32	20	12		
	Total	...	...	...	...	...	1,239	1,239	...	1,239	418	157	261	...	
	16	2·6	...	...	...	...	55	55	...	55	32	20	12		
	17	2·6	...	...	...	...	69	69	...	69	41	20	21		
	18	2·4	...	...	...	...	48	48	...	48	31	20	11		
	19	2·3	...	...	...	...	90	90	...	90	54	20	34		
	20	2·5	...	...	...	...	77	77	...	77	67	20	47	43·09	
	21	3·0	...	...	...	...	129	129	...	129	76	20	56		
	22	2·8	...	...	...	...	129	129	...	129	76	20	56		
	23	2·7	...	...	...	...	149	149	66	83	76	20	56		
	24	2·7	...	...	...	...	220	220	131	89	76	20	56		
	25	2·7	...	...	...	...	355	355	263	92	76	20	56		
	26	2·7	...	...	...	...	96	96	...	96	76	20	56		
	27	2·8	...	...	...	...	112	112	...	112	70	20	50	C 44·99	
	28	4·0	...	...	...	...	114	114	...	114	48	20	28		
	29	3·4	...	...	...	...	115	115	...	115	42	20	22		
	30	3·1	...	...	...	...	108	108	...	108	34	20	14		
Total ...		...	...	...	...	...	1,866	1,866	460	1,406	875	300	575	...	
Monthly Total		...	...	...	...	...	3,105	3,105	460	2,645	1,293	457	836	...	

Month and date		Corresponding gauge reading at Cauvery Dam	Upper Anikat into Coleroon	Grand Anikat into Coleroon	Discharge through 150 yards Calingula	Total of Cols. 3, 4 and 5	Total discharge at Lower Anikat	Quantity due to leakage, etc., Col. 6—Col. 6	Lower Anikat into Coleroon	Net quantity used for irrigation, Col. 7—Col. 9	Quantity passed through Vadavar	Quantity required for direct irrigation 20 m. c. per day	Net flow to Veeranam tank, Col. 11—Col. 12	Level of Veeranam tank	Remarks
1		2	3	4	5	6	7	8	9	10	11	12	13	14	15
December 1905.	1	2·9	...	...	...	...	101	101	...	101	24	20	4		
	2	2·8	...	...	...	...	96	96	...	96	10	10	...		
	3	2·7	...	...	...	...	71	71	...	71	3	3	...		
	4	2·8	...	...	...	...	73	73	...	73	3	3	...	C	
	5	2·9	...	...	...	...	57	57	...	57	3	3	...	44·89	
	6	2·8	...	...	...	...	51	51	...	51	2	2	...		
	7	2·7	...	...	...	...	26	26	...	26	27	20	7		
	8	2·7	...	...	...	...	60	60	...	60	29	20	9		
	9	2·5	...	...	...	...	78	78	...	78	21	20	1		
	10	2·4	...	...	...	...	81	81	...	81	4	4	...		
	11	2·3	...	...	...	...	47	47	...	47	12	12	...		
	12	2·2	...	...	...	...	67	67	...	67	3	3	...	C	
	13	2·1	...	...	...	...	58	58	...	58	1	1	...	43·69	
	14	2·1	...	...	...	...	55	55	...	55	...	...	...		
	15	2·0	...	...	...	...	55	55	...	55	...	...	...		
	Total	...	...	...	...	...	976	976	...	976	142	121	21	...	
	16	1·9	...	...	...	...	55	55	...	55	...	...	...		
	17	1·9	...	...	...	...	55	55	...	55	...	...	...		
	18	1·9	...	...	...	...	55	55	...	55	...	...	...		
	19	1·9	...	...	...	...	54	54	...	54	...	...	...		
	20	1·8	...	...	...	...	54	54	...	54	...	...	...		
	21	1·7	...	...	...	...	48	48	...	48	...	...	...	42·49	
	22	1·7	...	...	...	...	46	46	...	46	...	...	...		
	23	1·6	...	...	...	...	48	48	...	48	...	...	...		
	24	1·6	...	...	...	...	4	4	...	4	4	4	...		
	25	1·3	...	...	...	...	61	61	...	61	4	4	...		
	26	1·2	...	...	...	..	44	44	...	44	...	...	...		
	27	1·2	...	...	...	...	40	40	...	40	...	...	...		
	28	1·0	...	...	...	...	40	40	...	40	...	..	...	40·19	
	29	1·1	...	...	...	...	40	40	...	40	...	...	...		
	30	0·9	...	...	...	...	95	95	...	95	...	...	...		
	31	0·7	...	...	...	...	4	4	...	4	4	4	...		
Total ...		...	...	...	...	...	743	743	...	743	12	12	...	...	
Monthly Total		...	...	...	...	...	1,719	1,719	...	1,719	154	133	21	...	

APPENDIX K—1—*contd.*

Month and date	Corresponding gauge reading at Cauvery Dam	Upper Anikat into Coleroon	Grand Anikat into Coleroon	Discharge through 150 yards Calingula	Total of Cols. 3, 4 and 5	Total discharge at Lower Anikat	Quantity due to leakage, etc., Col. 7—Col. 6	Lower Anikat into Coleroon	Net quantity used for irrigation, Col. 7—Col. 9	Quantity passed through Vadavar	Quantity required for direct irrigation 20 m. c. per day	Net flow to Veeranam tank, Col. 11—Col. 12	Level of Veeranam tank	Remarks
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
January 1906. 1	0·7	...	...	...	...	143	143	...	143	...	...	...		
2	0·7	...	...	...	...	43	43	...	43	...	...	...		
3	0·6	...	...	...	...	35	35	...	35	...	...	...		
4	0·5	...	...	...	...	35	35	...	35	...	...	...	38·49	
5	0·5	...	...	...	...	35	35	...	35	...	...	...		
6	0·5	...	...	...	...	51	51	...	51	...	...	...		
7	0·4	...	...	..	..	1	1	...	1	2	2	...		
8	0·4	...	...	...	...	114	114	...	114	4	4	...		
9	0·2	...	...	...	...	48	48	...	48	...	...	...		
10	0·2	...	...	...	...	44	44	...	44	...	...	...		
11	0·2	...	...	...	...	35	35	...	35	...	...	...		
12	0·2	...	...	...	...	35	35	...	35	...	...	...	38·59	
13	0·2	...	...	...	...	50	50	...	50	...	...	...		
14	0·1	...	...	...	...	2	2	...	2	2	2	...		
15	0·1	...	...	...	...	98	98	...	98	...	...	...		
Total	...	...	...	...	...	769	769	...	769	8	8	...	...	
16	0·1	...	...	...	...	74	74	...	74	1	1	...		
17	0·2	...	...	...	...	557	557	408	149	76	20	56		
18	0·4	...	...	...	...	81	81	...	81	33	20	13		
19	0·3	...	...	...	...	85	85	...	85	40	20	20		
20	0·3	...	...	...	...	68	68	...	68	27	20	7	...	
21	0·4	...	...	...	...	43	43	...	43	14	14	...		
22	2·8	...	...	...	...	34	34	...	34	5	5	...		
23	2·0	...	...	...	...	61	61	...	61	5	5	...		
24	1·8	...	...	...	...	56	56	...	56	...	...	...		
25	1·6	...	...	...	...	51	51	...	51	...	...	...		
26	1·4	...	...	...	...	60	60	...	60	...	...	...		
27	1·3	...	...	...	...	42	42	...	42	...	...	...		
28	1·1	...	...	...	...	12	12	...	12	12	12	...	42·59	
29	1·2	...	...	...	...	40	40	...	40	12	12	...		
30	1·0	...	...	...	...	68	68	...	68	2	2	...		
31	0·9	...	...	...	...	49	49	...	49	...	...	...		
Total ...	...	...	...	...	...	1,381	1,381	408	973	227	131	96	...	
Monthly Total	...	...	...	...	...	2,150	2,150	408	1,742	235	139	96	...	

APPENDIX K—1—*contd.*

Month and date		Corresponding gauge reading a Cauvery Dam	Upper Anikat into Coleroon	Grand Anikat into Coleroon.	Discharge through 150 yards Calingula	Total of Cols. 3, 4 and 5	Total discharge at Lower Anikat	Quantity due to leakage, etc., Col. 7—Col. 6	Lower Anikat into Coleroon	Net quantity used for irrigation, Col. 7—Col. 9	Quantity passed through Vadavar	Quantity required for direct irrigation 20 m. c. per day	Net flow to Veeranam tank, Col. 11—Col. 12	Level of Veeranam tank	Remarks
1		2	3	4	5	6	7	8	9	10	11	12	13	14	15
June 1906	1	0·7	...	...	...	...	...	...	...	...	...	...	...	...	
	2	0·7	...	...	...	...	...	...	...	...	...	...	...	...	
	3	0·7	...	...	...	...	...	...	...	...	...	...	...	...	
	4	0·7	...	...	...	...	...	...	...	...	...	...	...	...	
	5	0·9	...	...	...	...	...	...	...	...	...	...	...	...	
	6	0·9	...	...	...	...	...	...	...	...	...	...	...	...	
	7	0·9	...	...	...	...	...	...	...	...	...	...	...	...	
	8	0·8	...	...	...	...	...	...	...	...	...	...	...	...	
	9	1·5	...	...	...	...	...	...	...	...	...	...	...	...	
	10	1·0	...	...	...	...	...	...	...	...	...	...	...	...	
	11	1·0	...	...	...	...	...	...	...	...	...	...	...	...	
	12	0·9	...	...	...	...	...	...	...	...	...	...	...	...	
	13	0·8	...	...	...	...	...	...	...	...	...	...	...	...	
	14	0·8	...	...	...	...	...	...	...	...	...	...	...	...	
	15	0·9	...	...	...	...	...	...	...	...	...	...	...	...	
	Total	...	...	...	...	...	...	...	...	...	...	...	...	...	
	16	1·0	...	...	...	...	...	...	...	...	...	...	...	...	
	17	1·3	...	...	...	...	...	...	...	...	...	...	...	...	
	18	2·0	...	...	...	...	...	...	...	...	...	...	...	...	
	19	1·7	...	...	...	...	...	...	...	...	...	...	...	...	
	20	1·5	...	...	...	...	...	...	...	...	...	...	...	...	
	21	1·3	...	...	...	...	...	...	...	...	...	...	...	...	
	22	1·1	...	...	...	...	...	...	...	...	...	...	...	...	
	23	0·9	...	...	...	...	...	...	...	...	...	...	...	...	
	24	1·1	...	...	...	...	...	...	...	...	...	...	...	...	
	25	2·9	...	...	...	...	...	...	...	...	...	...	...	...	
	26	3·1	...	...	...	...	...	...	...	...	...	...	...	...	
	27	2·8	...	...	...	...	...	...	...	...	...	...	...	...	
	28	4·5	657	...	657	...	...	...	...	...	...	...	...	...	
	29	4·8	...	...	...	...	...	...	...	...	...	...	...	...	
	30	4·1	...	...	...	...	...	...	...	...	...	...	...	...	
	Total	...	657	...	657	...	...	...	...	...	...	...	...	...	
Monthly Total		...	657	...	657	...	...	...	...	...	...	...	...	...	

APPENDIX K—1—*contd.*

Month and date		Corresponding gauge reading at Cauvery Dam	Upper Anikat into Coleroon	Grand Anikat into Coleroon	Discharge through 150 yards Collingulu	Total of Cols. 3, 4 and 5	Total discharge at Lower Anikat	Quantity due to leakage, etc., Col. 7—Col. 6	Lower Anikat into Coleroon	Net quantity used for irrigation, Col. 7—Col. 9	Quantity passed through Vadavar	Quantity required for direct irrigation 20 m. c. per day	Net flow to Veeranam tank, Col. 11—Col. 12	Level of Veeranam tank	Remarks
1		2	3	4	5	6	7	8	9	10	11	12	13	14	15
July 1906.	1	3·7	...	...	...	...	14	14	...	14	14	14	...	...	
	2	3·2	...	...	..	...	16	16	...	16	16	16	...	...	
	3	2·9	...	...	...	...	12	12	...	12	12	12	...	...	
	4	2·8	..	...	...	...	35	35	...	35	...	...	...	...	
	5	2·7	...	...	...	...	28	28	...	28	...	...	...	...	
	6	2·4	...	...	...	...	28	28	...	28	...	...	...	...	
	7	2·1	...	...	...	...	28	28	...	28	...	...	...	...	
	8	1·8	...	...	...	...	37	37	...	37	...	...	...	...	
	9	1·6	...	...	...	...	...	...	...	...	...	...	...	...	
	10	2·3	...	...	...	...	45	45	...	45	...	...	...	...	
	11	1·4	...	...	...	...	33	33	...	33	...	...	...	...	
	12	3·8	...	...	...	...	41	41	...	41	...	...	...	...	
	13	4·1	...	...	...	...	30	30	...	30	...	...	...	...	
	14	4·5	...	...	...	...	45	45	...	45	...	...	...	...	
	15	4·2	...	...	...	...	5	5	...	5	5	... 5	...	...	
	Total	...	...	...	...	...	397	397	...	397	47	47	...	...	
	16	4·7	...	...	...	...	50	50	...	50	3	3	...	...	
	17	4·6	...	...	...	...	28	28	...	28	...	...	...	...	
	18	4·1	...	...	...	...	28	28	...	28	...	...	...	...	
	19	3·9	...	...	...	...	40	40	...	40	...	...	...	...	
	20	3·5	...	...	...	...	46	46	...	46	...	...	...	...	
	21	4·4	...	...	...	...	76	76	4,154	76	...	...	...	...	
	22	8·0	1,681	1,508	252	3,441	4,366	925	4,630	212	87	20	67	...	
	23	8·5	1,969	1,184	317	3,470	4,847	1,377	10,725	217	99	20	79	...	
	24	9·6	3,465	2,467	465	6,397	10,959	4,562	10,780	234	113	20	93	...	
	25	9·9	3,467	2,898	500	6,865	11,012	4,177	10,711	232	115	20	95	...	
	26	9·9	4,102	2,726	500	7,328	10,941	3,613	9,660	230	112	20	92	...	
	27	9·3	4,923	1,899	425	7,247	9,868	2,621	4,949	208	100	20	80	...	
	28	8·6	3,967	964	337	5,268	5,088	...	3,958	139	...	...	...	...	
	29	7·8	3,294	442	227	3,963	4,098	135	2,959	140	...	...	...	...	
	30	7·0	2,481	72	135	2,688	3,094	406	2,376	135	...	...	...	...	
	31	7·0	2,395	...	135	2,530	2,599	69	...	223	87	20	67	...	
Total ...		...	31,744	14,160	3,293	49,197	67,140	18,123	64,902	2,238	716	143	143	...	
Monthly Total		...	31,744	14,160	3,293	49,197	67,537	18,520	64,902	2,635	763	143	573	...	

APPENDIX K—1—*contd.*

Month and date		Corresponding gauge reading at Cauvery Dam	Upper Anikat into Coleroon	Grand Anikat into Coleroon	Discharge through 150 yards Calingula	Total of Cols. 3, 4 and 5	Total discharge at Lower Anikat	Quantity due to leakage, etc., Col. 7—Col. 6	Lower Anikat into Coleroon	Net quantity used for irrigation, Col. 7—Col. 9	Quantity passed through Vadavar	Quantity required for direct irrigation 20 m. c. per day	Net flow to Veeranam tank, Col. 11-12	Level of Veeranam tank	Remarks
1		2	3	4	5	6	7	8	9	10	11	12	13	14	15
August 1906.	1	7·0	2,336	...	135	2,471	2,715	244	2,491	224	87	20	67		
	2	7·5	2,248	...	191	2,439	2,240	...	2,029	211	86	20	66		
	3	7·5	1,118	...	191	1,309	2,074	765	1,867	207	86	20	66		
	4	7·4	501	26	180	707	1,634	927	1,430	204	84	20	64	41·09	
	5	7·0	50	284	135	469	812	343	612	200	78	20	58		
	6	6·6	...	77	99	176	212	36	67	145	76	20	56		
	7	6·2	...	...	63	63	204	141	...	204	76	20	56		
	8	5·8	...	...	30	30	204	174	...	204	76	20	56		
	9	5·9	...	...	36	36	487	451	204	283	78	20	58		
	10	6·1	...	80	55	135	751	616	543	208	81	20	61		
	11	5·7	...	...	21	21	607	586	407	200	80	20	60	42·79	
	12	5·4	...	...	...	...	331	331	134	197	76	20	56		
	13	7·0	1,217	588	135	1,940	641	...	434	207	84	20	64		
	14	6·0	301	268	42	611	902	291	695	207	83	20	63		
	15	6·3	1,705	632	70	2,407	2,257	...	2,040	217	89	20	69		
	Total	...	9,476	1,955	1,383	12,814	16,071	4,905	12,953	3,118	1,220	300	920	...	
	16	6·9	314	888	128	1,330	3,324	1,994	3,102	222	99	20	79		
	17	5·5	220	330	3	553	2,275	1,722	2,058	217	91	20	71		
	18	7·0	451	1,257	135	1,843	4,101	2,258	3,874	227	99	20	79		
	19	7·5	347	1,698	191	2,236	5,371	3,135	5,140	231	105	20	85		
	20	8·9	5,559	1,389	373	7,321	5,822	...	5,621	201	97	20	77	42·79	
	21	6·6	1,922	300	99	2,321	2,644	323	2,441	203	92	20	72		
	22	6·0	2,974	263	42	3,279	2,284	...	2,090	194	87	20	67		
	23	6·0	2,311	209	42	2,562	1,848	...	1,702	146	87	20	67		
	24	6·0	3,042	407	42	3,491	2,468	...	2,327	141	90	20	70		
	25	6·0	1,628	264	42	1,934	1,809	...	1,655	154	84	20	64		
	26	6·0	...	295	42	337	1,148	811	994	154	80	20	60		
	27	6·0	2,059	580	42	2,681	1,852	...	1,685	167	87	20	67	C & D	
	28	7·7	3,082	1,233	215	4,530	4,282	...	4,070	212	98	20	78	43·79	
	29	9·2	5,982	2,357	410	8,749	2,533	...	2,296	237	111	20	91		
	30	9·7	6,238	1,433	475	9,146	3,006	...	2,754	252	106	20	86		
	31	9·0	4,941	1,974	387	7,302	3,777	...	3,561	216	98	20	78		
Total ...		...	41,070	15,877	2,668	59,615	48,544	10,243	45,370	3,174	1,511	320	1,191	1,191	
Monthly Total		...	50,546	17,832	4,051	72,429	64,615	15,148	58,323	6,292	2,731	620	2,111	...	

APPENDIX K-1—*contd.*

Month and date		Corresponding gauge reading at Cauvery Dam	Upper Anikat into Coleroon	Grand Anikat into Coleroon	Discharge through 150 yards Calingula	Total of Cols. 3, 4 and 5	Total discharge at Lower Anikat	Quantity due to leakage, etc., Col. 7—Col. 6	Lower Anikat into Coleroon	Net quantity used for irrigation, Col. 7—Col. 9	Quantity passed through Vadavar	Quantity required for direct irrigation 20 m. c. per day	Net flow to Veeranam tank, Col. 11-12	Level of Veeranam tank	Remarks
1		2	3	4	5	6	7	8	9	10	11	12	13	14	15
September 1906	1	7·7	3,106	859	215	4,180	4,245	65	4,027	218	97	20	77		
	2	6·7	3,340	362	108	3,810	3,358	...	3,147	211	92	20	72		
	3	7·0	2,212	225	135	2,757	2,123	...	1,919	204	87	20	62		
	4	7·0	1,603	227	135	1,965	2,031	66	1,825	206	9	9	...	C & D	
	5	7·0	797	...	135	932	1,480	548	1,311	170	82	20	62	43·89	
	6	6·7	...	...	108	108	403	295	204	199	78	20	58		
	7	6·7	...	...	108	108	302	194	102	200	78	20	58		
	8	6·4	...	...	85	85	264	179	67	197	76	20	56		
	9	6·6	...	...	99	99	197	98	...	197	76	20	56		
	10	7·0	...	...	135	135	335	200	136	199	78	20	58		
	11	6·7	...	...	108	108	599	491	407	192	80	20	60		
	12	6·1	...	...	55	55	163	108	...	163	70	20	50	43·19	
	13	5·6	...	...	12	12	166	154	...	166	70	20	50		
	14	5·0	...	...	...	...	143	140	...	143	44	20	24		
	15	4·8	...	...	...	...	133	133	...	133	38	20	18		
	Total	...	11,058	1,673	1,438	14,169	15,912	2,674	13,144	2,798	1,055	289	766	...	
	16	4·8	...	...	...	...	141	141	...	141	44	20	24		
	17	5·0	...	...	...	...	156	156	...	156	58	20	38		
	18	5·3	...	...	...	...	178	178	...	178	72	20	52		
	19	5·7	...	...	21	21	160	139	...	160	58	20	38		
	20	5·3	...	...	...	...	166	166	...	166	70	20	50	42·97	
	21	5·4	...	...	...	...	164	164	...	164	60	20	40		
	22	4·9	...	...	...	...	157	157	...	157	55	20	35		
	23	4·7	...	...	...	...	148	141	...	141	51	20	31		
	24	5·4	...	...	...	...	131	131	...	131	38	20	18		
	25	6·0	...	...	42	42	118	76	...	118	31	20	11		
	26	5·5	...	...	3	3	120	91	...	124	26	20	6		
	27	5·1	...	...	...	...	93	93	...	93	10	10	...	42·69	
	28	5·3	...	...	...	...	71	71	...	71	5	5	...		
	29	5·0	...	...	...	...	42	42	...	42	18	18	...		
	30	4·4	...	...	...	...	68	68	...	68	68	20	48		
Total ...		...	...	...	66	66	1,910	1,814	...	1,910	664	273	391	...	
Monthly Total		...	11,058	1,673	1,504	14,235	17,852	4,488	13,144	4,708	1,719	562	1,157	...	

Month and date	Corresponding gauge reading at Cauvery Dam	Upper Anikat into Coleroon	Grand Anikat into Coleroon	Discharge through 150 yards Calingula	Total of Cols. 3, 4 and 5	Total discharge at Lower Anikat	Quantity due to leakage, etc., Col. 7—Col. 6	Lower Anikat into Coleroon	Net quantity used for irrigation, Col. 7—Col. 9	Quantity passed through Vadavar	Quantity required for direct irrigation 20 m. c. per day	Net flow to Veeranam tank, Col. 11—Col. 12	Level of Veeranam tank	Remarks
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
October 1906. 1	4·0	...	...	...	...	95	95	...	95	59	20	39		
2	3·7	..	...	...	...	133	133	...	133	29	20	9		
3	3·7	...	...	...	...	112	112	...	112	17	17	...		
4	3·7	...	...	...	...	95	95	...	95	14	14	...	41·79	
5	3·3	...	...	...	...	97	97	..	97	14	14	...		
6	4·0	...	...	...	...	99	99	...	99	10	10	...		
7	5·1	...	...	...	...	93	93	...	93	10	10	...		
8	5·9	...	...	36	36	74	38	...	74	16	16	...		
9	7·3	355	...	168	523	132	...	...	132	59	20	39		
10	6·9	...	...	128	128	...	...	...	...	76	20	56		
11	7·0	529	...	135	664	342	...	134	208	76	20	56		
12	7·2	1,013	...	158	1,171	1,713	542	1,486	226	86	20	66	40·39	
13	7·5	2,050	...	191	2,241	2.360	120	2,125	236	90	20	70		
14	7·5	1,695	...	191	1,886	2,974	1,088	2,732	242	92	20	72		
15	7·0	2,638	...	135	2,773	2,781	8	2,537	244	94	20	74		
Total	...	8,280	...	1,142	9,422	11,000	2,520	9,015	2,086	742	261	481	...	
16	7·0	2,286	...	135	3,609	3,180	759	2,429	751	97	20	77		
17	6·5	3.520	...	89	3,010	2,896	...	2,700	196	97	20	77		
18	6·2	2,947	..	63	2,051	2,931	...	2,803	128	97	20	77		
19	6·0	2,009	...	42	2,466	2,972	921	2,877	95	94	20	74		
20	5·2	2,466	...	...	2,771	2,833	367	2,741	92	91	20	71	40·39	
21	5·5	2,768	...	3	2,080	2,971	200	2,876	95	94	20	74		
22	4·7	2,080	...	...	2,156	2.326	246	2,243	83	87	20	67		
23	4·6	2,156	...	...	...	7.214	5,058	7,128	86	87	20	67		
24	4·4	...	...	...	...	1,754	1,754	1,670	84	85	20	65		
25	4·1	...	...	...	2,088	1,665	1,665	1,581	84	85	20	65		
26	4·9	2,088	...	...	2,015	1,889	...	1,804	85	86	20	66		
27	4·9	2,015	...	...	...	1,642	...	1,560	82	82	20	62		
28	4·4	...	...	...	...	1,542	1,542	1,460	82	82	20	62	C & D• 44·99	
29	4·3	...	...	...	...	1,261	1,261	1,161	100	83	20	63		
30	4·3	...	...	...	...	682	682	546	136	82	20	62		
31	4·2	...	...	...	...	492	492	...	492	78	20	58		
Total ...	...	24,335	...	332	24,667	38,250	14,947	35,579	2,668	1,407	320	1,087	...	
Monthly Total	...	32,615	...	1,474	34,089	49,350	17,467	44,594	4,754	2,149	581	1,568	...	

APPENDIX K—1—*contd.*

Month and date		Corresponding gauge reading at Cauvery Dam	Upper Anikat into Coleroon	Grand Anikat into Coleroon	Discharge through 150 yards Calingula	Total of Cols. 3, 4 and 5	Total discharge at Lower Anikat	Quantity due to leakage, etc., Col. 7—Col. 6	Lower Anikat into Coleroon	Net quantity used for irrigation, Col. 7—Col. 9	Quantity passed through Vadavar	Quantity required for direct irrigation 20 m. c. per day	Net flow to Veeranam tank, Col. 11—Col. 12	Level of Veeranam tank	Remarks
1		2	3	4	5	6	7	8	9	10	11	12	13	14	15
November 1906.	1	4·1	...	...	...	...	175	175	...	175	76	20	56	C & D 44·59	
	2	3·7	...	...	...	...	175	175	...	175	76	20	56		
	3	3·5	...	...	...	...	141	141	...	141	52	20	32		
	4	3·3	...	...	...	...	129	129	...	129	44	20	24		
	5	3·1	...	...	...	...	115	115	...	115	27	20	7		
	6	3·0	...	...	...	...	94	94	...	94	14	14	...		
	7	3·0	...	...	...	...	119	119	...	119	26	20	6		
	8	2·9	...	...	...	...	131	131	...	131	31	20	11	C 43·59	
	9	3·7	...	...	...	...	124	124	...	124	26	20	6		
	10	4·3	...	...	...	...	124	124	...	124	31	20	11		
	11	4·2	...	...	...	...	143	143	...	143	60	20	40		
	12	4·5	...	...	...	...	1,108	1,108	970	138	76	20	56		
	13	4·1	...	...	...	...	2,427	2,427	2,315	112	87	20	67		
	14	4·1	...	...	...	...	2,816	2,816	2,728	88	87	20	67		
	15	4·2	...	...	...	...	4,060	4,060	3,993	67	76	20	56		
	Total	...	...	...	...	...	11,881	11,881	10,006	1,875	789	294	495	...	
	16	6·6	3,327	...	99	3,426	2,525	...	2,449	76	76	20	56	C 47·19	
	17	4·9	1,877	...	...	1,877	1,843	...	1,768	75	76	20	56		
	18	3·9	...	...	...	...	1,393	1,393	1,309	84	76	20	56		
	19	4·2	...	...	...	...	1,039	1,039	941	98	76	20	56		
	20	3·4	...	...	...	...	844	844	736	108	76	20	56		
	21	3·2	...	...	...	...	813	813	736	77	76	20	56		
	22	3·0	...	...	...	...	1,597	1,597	1,521	76	76	20	56		
	23	3·0	...	...	...	...	1,800	1,800	1,721	79	80	20	60		
	24	3·0	...	...	...	...	1,118	1,118	1,040	78	78	20	58		
	25	3·2	...	...	...	...	1,886	1,886	1,811	75	76	20	56		
	26	3·1	...	...	...	...	3,016	3,016	3,016	...	...	...	...	C 45·19	
	27	4·8	...	...	..	...	3,312	3,312	3,312	...	...	...	...		
	28	3·7	...	...	...	...	2,938	2,938	1,746	1,192	...	...	...		
	29	3·3	...	...	...	...	1,021	1,021	1,021	...	..	...	...		
	30	3·1	...	...	...	...	1,467	1,467	1,467	...	...	...	...		
Total ...		...	5,204	...	99	5,303	22 244	22,244	24,594	2,018	766	200	566	...	
Monthly Total		...	5,204	...	99	5,303	34,126	34,126	34,600	3,893	1,555	494	1,061	...	

Month and date		Corresponding gauge reading at Cauvery Dam	Upper Anikat into Coleroon	Grand Anikat into Coleroon	Discharge through 150 yards Culmigula	Total of Cols. 3, 4 and 5.	Total discharge at Lower Anikat	Quantity due to leakage, etc. Col. 7—Col. 6	Lower Anikat into Coleroon	Net quantity used for irrigation, Col. 7—Col. 9	Quantity passed through Vadavar	Quantity required for direct irrigation 20 m. c. per day	Net flow to Veeranam tank, Col. 11—Col. 12	Level of Veeranam tank	Remarks
1		3	3	4	5	6	7	8	9	10	11	12	13	14	15
December 1906.	1	3·0	...	...	...	...	711	711	711	...	...	...	...	...	
	2	3·0	...	...	...	...	406	406	406	...	...	...	...	...	
	3	3·4	...	...	...	...	233	233	179	54	...	...	...	...	
	4	3·0	...	...	...	...	160	160	...	160	63	20	43	...	
	5	2·9	...	...	...	...	134	134	...	134	46	20	26	...	
	6	2·8	...	...	...	...	128	128	...	128	49	20	29	...	
	7	2·9	...	...	...	...	432	433	345	87	42	20	22	...	
	8	2·8	...	...	...	...	378	378	363	15	15	15	...	...	
	9	2·9	...	...	...	...	458	458	448	10	11	11	...	...	
	10	4·1	...	...	...	...	562	562	536	26	26	20	6	...	
	11	3·9	...	...	...	...	549	549	499	50	51	20	31	...	
	12	3·7	...	...	...	...	1,139	1,139	1,064	75	76	20	56	...	
	13	3·4	...	...	...	..	877	877	801	76	76	20	56	...	
	14	3·1	...	...	...	...	255	255	185	70	53	20	33	...	
	15	3·0	...	...	...	...	64	64	...	64	40	20	20	...	
	Total	...	...	...	...	...	6,486	6,486	5,537	949	548	286	322	...	
	16	2·9	...	...	...	...	89	89	...	89	42	20	22	...	
	17	2·8	...	...	...	...	102	102	...	102	38	20	18	...	
	18	2·8	...	...	...	...	111	111	...	111	32	20	12	...	
	19	2·7	...	...	...	...	131	131	...	131	32	20	12	...	
	20	2·7	...	...	...	...	125	125	...	125	26	20	6	...	
	21	2·7	...	...	...	...	93	93	...	93	14	14	...	...	
	22	2·6	...	...	...	...	88	88	...	88	11	11	...	...	
	23	4·7	...	...	...	...	84	84	...	84	8	8	...	...	
	24	6·0	...	...	42	42	113	71	...	113	14	14	...	...	
	25	4·8	...	...	...	...	167	167	...	167	41	20	21	...	
	26	4·3	...	...	...	...	212	212	66	146	68	20	48	...	
	27	3·7	...	...	...	...	484	484	336	148	76	20	56	...	
	28	3·3	...	...	...	...	883	883	735	148	76	20	56	...	
	29	3·0	...	...	...	...	955	955	802	153	76	20	56	...	
	30	3·2	...	...	...	..	829	829	669	160	76	20	56	...	
	31	3·4	...	...	...	...	160	160	...	160	76	20	56	...	
Total ...		...	...	...	42	42	4,626	4,584	2,608	1,929	706	287	419	...	
Monthly Total		...	...	...	42	42	11,112	11,070	8,145	2,878	1,254	573	741	...	

Month and date		Corresponding gauge reading at Cauvery Dam	Upper Anikat into Coleroon	Grand Anikat into Coleroon	Discharge through 150 yards Callingula	Total of Cols. 3, 4 and 5	Total discharge at Lower Anikat	Quantity due to leakage, etc., Col. 7—Col. 6	Lower Anikat into Coleroon	Net quantity used for irrigation, Col. 7—Col. 9	Quantity passed through Vadavar	Quantity required for direct irrigation 20 m. c. per day	Net flow to Veeranam tank, Col. 11—Col. 12	Level of Veeranam tank	Remarks
1		2	3	4	5	6	7	8	9	10	11	12	13	14	15
January 1907.	1	3·2	...	...	...	...	155	...	...	155	72	20	52		
	2	3·8	...	...	...	...	121	...	...	121	44	20	24		
	3	3·4	...	...	...	...	114	...	...	114	41	20	21		
	4	3·0	...	...	...	...	113	...	...	113	40	20	20	44·49	
	5	2·9	...	...	...	...	99	...	...	99	25	20	5		
	6	2·8	...	...	...	...	110	1	...	110	19	19	...		
	7	2·8	...	...	...	...	89	8	...	89	11	11	...		
	8	2·7	...	...	...	...	84	8	...	84	8	8	...		
	9	2·7	...	...	...	...	78	7	...	78	5	5	...		
	10	2·7	...	...	...	...	70	71	...	70	4	4	...		
	11	2·6	...	...	...	...	77	77	...	77	4	4	...	44·09	
	12	2·6	...	...	...	...	80	80	...	80	4	4	...		
	13	2·6	...	...	...	...	82	82	...	82	4	4	...		
	14	2·5	...	...	...	...	80	80	...	80	5	5	...		
	15	2·5	...	...	...	...	85	85	...	85	8	8	...		
	Total	...	...	...	...	...	1,437	1,437	...	1,437	294	172	122	...	
	16	2·5	...	...	...	...	73	73	...	73	5	5	...		
	17	2·4	...	...	...	...	71	71	...	71	4	4	...		
	18	2·5	...	...	...	...	65	65	...	70	4	4	...		
	19	2·4	...	...	...	...	56	56	...	65	4	4	...	43·19	
	20	2·2	...	...	...	...	58	58	...	56	4	4	...		
	21	2·0	...	...	...	...	57	57	...	58	...	...	...		
	22	1·9	...	...	...	...	58	58	...	57	...	...	...		
	23	1·9	...	...	...	...	57	57	...	58	...	...	...		
	24	1·9	...	...	...	...	60	60	...	57	...	...	...		
	25	1·8	...	...	...	...	26	26	...	60	...	...	...		
	26	1·8	...	...	...	...	...	...	...	26	11	11	...		
	27	1·8	...	...	...	...	...	...	...	31	31	20	11	42·29	
	28	1·8	...	...	...	...	31	31	...	62	41	20	21		
	29	1·6	...	...	...	...	62	62	...	63	15	15	...		
	30	1·6	...	...	...	...	63	63	...	50	6	6	...		
	31	1·6	...	...	...	...	50	50	...	...	...	...	...		
Total ...		...	...	...	...	...	857	857	...	857	121	89	32	...	
Monthly Total		...	...	...	...	...	2,294	2,294	...	2,294	415	261	154	...	

Compara[illegible]lue to the impounding at the Kannambadi Reservoir by [illegible]e and the Cauvery Dam.

Year	From	[illegible]on water [illegible] balan-ctor		Compensation water running to waste			Minus flow at the Cauvery Dam			Total quantity of water surplusing at the Cauvery Dam	Quantity of useful surplus up to 7 feet limit	Remarks
			Percentage to resulting flow	Number of days	Quantity	Percentage to resulting flow	Number of days	Quantity	Percentage to resulting flow			
1	2		16	17	18	19	20	21	22	23	24	25
1899 ...	1st June	)	0·83	8	7439	7·15	6	4428	4·23	38417	17939	
	Do	5	1·70	4	2298	2·17	3	1701	1·61	36139	17133	
1902 ...	1st June	)	4·05	10	8593	7·85	7	2781	2·56	65406	11695	
	Do	1	3·23	8	4993	4·48	3	1142	1·02	64018	10539	
1905 ...	1st June	3	1·76	8	6456	3·16	8	3363	1·65	53795	29554	
	Do	)	3·17	11	4664	2·28	6	1344	0·65	54603	29203	
1913 ...	1st June	)	0·51	6	1638	0·61	3	456	0·17	117584	38598	
	Do	3	0·50	4	1476	0·55	2	300	0·11	122942	34027	

Appendix R.

Comparative Table shewing the effect on the quantity and incidence of flow at the Cauvery Dam due to the impounding at the Kannambadi Reservoir by taking 3 and 4 days as the time of transit between the reservoir site and the Cauvery Dam.

Year	From date	To date	Interval of transmission of flow from Kannambadi to Cauvery Dam	Total flow at Kannambadi	Total flow at Cauvery Dam	Total quantity available for impounding after serving Madras rights	Total quantity actually impounded excluding surplus and compensation water	Resulting flow at Cauvery Dam	Number of days of impounding	Compensation water			Compensation water acting as a balancing factor			Compensation water running to waste			Minus flow at the Cauvery Dam			Total quantity of water surplusing at the Cauvery Dam	Quantity of useful surplus up to 7 feet limit	Remarks
										Number of days on which due	Quantity	Percentage to resulting flow	Number of days	Quantity	Percentage to resulting flow	Number of days	Quantity	Percentage to resulting flow	Number of days	Quantity	Percentage to resulting flow			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1899 ...	1st June ...	31st August ...	3 days ...	77165	128946	50547	32370	104697	28	9	8308	7·93	3	869	0·83	8	7439	7·15	6	4428	4·23	38417	17939	
	Do ...	Do ...	4 days ...	77165	129336	50547	32369	105454	28	5	4083	3·90	3	1785	1·70	4	2298	2·17	3	1701	1·61	36139	17133	
1902 ...	1st June ...	31st July ...	3 days ...	105508	135067	93727	34640	109386	35	18	13174	12·04	11	4430	4·05	10	8593	7·85	7	2781	2·56	65406	11695	
	Do ...	Do ...	4 days ...	105508	137294	93727	34711	111268	35	14	8594	7·72	8	3601	3·23	8	4993	4·48	3	1142	1·02	64018	10539	
1905 ...	1st June ...	31st December...	3 days ...	135364	238702	74830	46389	203889	54	24	10039	4·82	19	3583	1·76	8	6456	3·16	8	3363	1·65	53795	29554	
	Do ...	Do ...	4 days ...	135364	238412	74830	45695	204264	54	30	11233	5·49	20	6479	3·17	11	4664	2·28	6	1344	0·65	54603	29203	
1913 ...	1st June ...	20th October ...	3 days ...	170202	303085	121038	47378	268190	62	10	3014	1·13	6	1376	0·51	6	1638	0·61	3	456	0·17	117584	38598	
	Do ...	19th October ...	4 days ...	170202	302556	120463	47902	267736	61	10	2854	1·06	7	1378	0·50	4	1476	0·55	2	300	0·11	122942	34027	

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PAGE

Exhibit Ma. 14.

MADRAS REJOINDER TO MYSORE—PARTS I AND II, MY. 9.

PART VIII—LEGAL ARGUMENTS.

Instead of replying to the Mysore memoranda paragraph by paragraph, it will be convenient at this stage to review briefly the course of their argument on the question of the extent of the prescriptive rights of Madras so as to indicate certain changes in the same from time to time and bring out prominently such of the arguments as now remain to be considered.

2. Some general arguments originally advanced or suggested, evidently on the basis of the *a priori* right of the Mysore State to use up all waters within the limits of the State, are no longer maintained and need no further notice—*vide* Mysore case, Appendix Q, paragraphs 1 and 2.

3. Again, the question of the particular kind of prescription that the authors of the Agreement had in view deserves no further discussion, as it is of little practical significance in the present circumstances and it is common ground that the principles both of the law of prescription and of the law of easements can apply here not in their entirety, but only by way of analogy so far as there is reasonable ground for such analogy.

4. It is also common ground that the rights of Madras are to be determined, as in the year 1910, on the basis of the Agreement of 1892. But Mysore are obviously wrong in trying to deduce from this that the authorities cited in the Madras case (Ma. 7, paragraphs 32 to 35) on the question of fixing the extent of prescriptive rights are *irrelevant* under the terms of the Agreement (Mysore reply, paragraph 4). The Agreement only says that the extent of the prescriptive rights of Madras is to be determined "in accordance with the law on the subject of prescriptive right to the use of water, etc." What, then, is the meaning of saying that the Agreement discards the use of legal authorities on that very question? It requires no stretch of imagination to see why Mysore attempt to get rid of the authorities on the point in this summary way. These authorities are utterly inconsistent with the Mysore contention that the prescriptive right covers only a particular acreage of land that has been irrigated during the last twenty years. The only answer that Mysore give is that they "doubtless show that once a right has been acquired, a change in the mode and the object of exercising it is justifiable to a certain extent, but they are not useful for the purpose in view inasmuch as they throw no light at all on the question enunciated by Madras itself, namely, how is the extent of the user to be measured?" (paragraph 13 of Appendix Q, Mysore case). That this reading by Mysore of the authorities is not correct and that the answer at best amounts to little more than a suggestion of distinction without any difference, is shown *infra* when dealing more fully with this point.

5. The claims of Madras in respect of water at and below the Upper Anicut are set forth and fully explained in Part III, paragraphs 7 to 15 and paragraph 44 of Ma. 9.

The claim may be divided into—

(i) the flow required during the period March to May, and
(ii) that required during the period June to February.

Claim (i) depends upon the understanding between Madras and Mysore in connection with the Sivasamudram supply (as to which see paragraph 78, My. 7, and paragraph 99, Madras, Part VI, Ma. 12).

The question of prescription arises chiefly in connection with claim (ii), *i.e.*, the flow during June to February.

6. The Mysore Durbar at first admitted (though only provisionally) the fairness of the Madras claim to seven feet at the Upper Anicut, and the difference between Madras and Mysore related to the rules for regulation and questions connected with losses in transmission.

7. When submitting their case to the Committee of Arbitration, the Durbar contended—

(*a*) that, consequent on the remodelling of the Upper Anicut, the seven feet claim was under present circumstances not justifiable (paragraph 7 of My. 1), and

(*b*) that, in any event, there was no justification for a claim for seven feet in five months out of nine (paragraphs 6, 8 and 9 of My. 1).

8. The Durbar went on to suggest that an addition of about 25 to 30 per cent. of the supplies provided in the Metur Project should be sufficient as against the uniform depth of seven feet claimed (paragraph 10 of My. 1); but when the Madras Government expressed their willingness to consider this basis (*vide* paragraph 10 of Ma. 3), the Durbar hastened substantially to withdraw the suggestion by putting forward an interpretation (*vide* My. 4), which, to say the least, is not the natural meaning of the words used.

9. To follow the Mysore argument on point (*a*) above, namely, the seven feet claim at the Upper Anicut, one has to bear in mind certain assumptions made by the Durbar and certain statements of fact they put forward. They distinguish between the depth of flow at the Upper Anicut and the flow over the Cauvery Dam. They postulate that "the Upper Anicut existed and still exists for the purpose of securing the irrigation supply required for the delta; but this supply is measured off at the Cauvery Dam. The Upper Anicut has no direct connection with the extent of the prescriptive right which has to be determined only by the conditions that have prevailed at the Cauvery Dam." They argue that, "in order to secure a seven feet flow at the Cauvery Dam, it used to be necessary before the remodelling, but not afterwards, to waste one foot of water over the Upper Anicut, and this one foot was not prescriptively used for irrigation in the delta" and they themselves add that "it is on this question of fact that all the arguments of Mysore regarding the claim to one foot are entirely based" (paragraph 10 of the Mysore reply, My. 9). The several assumptions and statements of facts made or implied in the above are not admitted by Madras. But to weigh the legal force of the argument, we have to analyse the Mysore position a bit more closely.

10. Madras submit that the Upper Anicut has all along been the starting point for the distribution by the Madras authorities of the water to which they are entitled, that it is with reference to the customary flow claimed and taken at that point that the extent of Madras rights should be fixed, that their right is a single entire right to the whole flow of the Agunda Cauvery corresponding to a gauge reading of seven feet at the Cauvery Dam before the Upper Anicut was remodelled and that it does not in any way concern or affect Mysore how the Madras authorities distribute that limit of supply along the several branches of the Agunda Cauvery. It is only in the event of this argument not being accepted that it would be necessary to consider separately the *several heads* of claim comprised in the general claim or as stated in paragraph II of the Madras Brief Statement (Ma. 1), *viz.*, the supply at the Cauvery Dam (as distinguished from the Upper Anicut), the supply for the Lower Coleroon system and the Veeranam tank, etc.

11. It is proved beyond doubt that prior to 1899 a flow of one foot over the Upper Anicut was necessary to give the required flow over the Cauvery Dam. It is urged by Mysore that the one foot flow over the Upper Anicut could not be regarded as even then used for irrigation, but only the flow over the Cauvery Dam. This is an artificial distinction with no basis in principle. If the flow at the anicut was necessary to give the required water for delta irrigation, the said limit flow is certainly required for and used for delta irrigation; for without it the delta irrigation could not be carried on in the accustomed manner. It is difficult to see what meaning Mysore would give to the expression "used for irrigation." Certainly, it cannot be confined to the quantity of water that is actually put on the fields. It must cover every step which is necessary to make that last step in the process of irrigation possible. This argument of Mysore is merely an attempt to obscure the fact that their claim practically amounts to denying to us any benefits out of the

remodelling works; that is, that by remodelling the Upper Anicut we have gained nothing but have lost the right to have any longer the quantity of water that we were *ex-hypothesi* entitled to before. It is said that after the remodelling the seven feet at the anicut is not necessary for the *delta irrigation*. Here comes the thin end of the wedge. Why confine the irrigation to the delta tract alone served by the Cauvery? The water flowing over the Upper Anicut was used before and according to the Madras case is still required for the purpose of irrigation under the Lower Coleroon system. But whether the water is used there or elsewhere, there is no reason why, in examining the conditions of irrigation, the investigation should be confined to the usual irrigated area in the delta tract alone, served by the right branch, that is, the Cauvery. This seems to be the whole basis for the Mysore assumption that the Upper Anicut is a mere regulator and that the extent of the prescriptive right does not depend upon the flow as calculated at the Upper Anicut. The legal ground on which the reduction of the Madras right by one foot over the Upper Anicut is based is the doctrine of abandonment, or in a somewhat different form, the principle of the cessation of easements of necessity. This will be dealt with below.

12. Another form in which the same argument is advanced is that stated in paragraph 20 of the Mysore reply (My. 9), *i.e.*, that the quantity of water respectively used in the past for the delta irrigation and the Lower Anicut irrigation "being separate and flowing in two distinct channels and also being separately measured, they cannot now be added together or redistributed in any different manner as now proposed by Madras. For the prescriptive right has, as already stated, to be considered with reference to the flow required for meeting the actual irrigational requirements of particular areas and not merely to the flow in general. Although a flow of 7 feet on the Cauvery Dam might have also meant a flow of 644 million cubic feet over the Upper Anicut under old conditions, this latter flow could not have been used for the delta irrigation. It is, therefore, not permissible to divert it for use now for the delta irrigation either partly or wholly, as such a diversion would make the burden on Mysore more onerous and would further be opposed to the law of prescription." This argument involves more fallacies than one. The Durbar, for the purpose of their own argument, find it convenient to leave the Upper Anicut alone and deal separately with the delta irrigation and the Lower Anicut irrigation; and then on this supposed division they proceed to build the further argument that the two should not be mixed up and redistributed between the two different channels. This itself is the best proof that the limit flow in the Agunda Cauvery and not the flow over the Cauvery Dam is the proper measure of the prescriptive right of Madras. The Durbar might as well urge that each channel in the delta tract should be separately dealt with and Madras should not redistribute the water-supply differently between them, but they evidently consider this too absurd to put forward. The Cauvery up to the Upper Anicut is the Agunda Cauvery (all one river), and the Upper Anicut is the starting point for all distribution lower down of the supply to which Madras claim to be entitled. It is no concern of Mysore how Madras utilise or distribute this quantity within its own limits, so long as it is used for purposes connected with irrigation. The argument that such a redistribution would make the burden on Mysore more onerous has certainly no substance, for the Durbar admit (see paragraph 8 of their reply My. 9) that the user of water which has passed their boundaries does not affect them in any way. The only question is, will such redistribution be in *excess* of the prescriptive rights of Madras? The authorities cited in paragraphs 32 to 35 and 44 and 45 of Ma. 7 show that it is not. The real basis of this contention of Mysore is their general argument that our prescriptive rights extend only to the water that may now be found necessary to irrigate the old irrigated area and to no more. This contention is dealt with *infra*.

13. It now remains to discuss in some detail the two points reserved for fuller consideration, namely, (1) that the one foot claim at the Upper Anicut has been abandoned or has ceased with the cessation of the necessity for it, and (2) that the extent of prescriptive rights of Madras is confined to water required for the particular acreage which has been cultivated during the last twenty years.

14. The two questions to some extent overlap each other and they may be conveniently dealt with together. The broad proposition put forward by Mysore

is that the right of Madras is confined to what can be shown to have been uninterruptedly done for twenty years since 1890. This in the very nature of things is untenable, for the limit, whether judged by the quantity of water used or the acreage of irrigation, must necessarily vary from year to year from causes often beyond the control of man. This aspect is noticed in the passage cited from Doss on Riparian Rights (in paragraph 32 of Ma. 7). The author says: "A difficulty may, however, arise if the user has been varying in extent. It has been held that in such cases the court is not bound to found its judgment solely on the actual user proved but may also take into consideration the surrounding circumstances." Among "surrounding circumstances" will certainly come the steps being taken by the dominant owner to expand the area of, or improve the supply to, irrigation, though of course he cannot acquire a right to more than what he *claimed* (see also the passage from Farnham cited in Ma. 7, paragraph 35).

15. Again, Madras have all along taken exception to treating the year 1890 as a starting point. This is a clear misapplication of the rule of prescription referred to in the Agreement. The Durbar know full well, as is clear from the case itself, that the extent of water now claimed by Madras is well within the quantity actually taken by Madras in the past and hence they are anxious to ignore the past altogether and start the case anew from 1890, and also rely on the argument that the user of the past was not proper or necessary, at any rate so much water is not required under modern conditions and they supplement this by the plea of abandonment. In dealing with this part of the case, one cannot help wondering at the refusal of the Durbar to perceive the inconsistency of the position taken up by them. They say that all the quantity of water that Madras was taking *prior to 1890* and all that Madras was then doing with it, should not count. They contend at the same time that any increase of cultivation in the delta *subsequent* to 1890 should not count either. This is certainly giving to the year 1890 almost a mystic importance. It is said that this is so because 1890 is the beginning of the period of 20 years before the present dispute. But what of that? It cannot be pretended that was the *beginning of our rights*. We had extensive rights before: what has become of them? Their answer is that under the agreement it is not enough that Madras *had* those rights but it is further necessary that those rights should be actually existing. This provokes the question why are they not in existence? It does not matter whether the water has been used quite in the same manner or in the same place, or perhaps on the same fields all along. Whether this is in accordance with the law of prescription or not, it is idle to contend that, while from 1835 onwards Madras has admittedly been endeavouring by enormous outlay of capital to put the seven feet flow of water in the Cauvery to the best use possible, the right to it has been abandoned by Madras. The Mysore argument, if accepted, necessarily involves this result, that, by no amount of economy in the use of water, by no improvement in the methods of distribution and control, is Madras entitled to expand its irrigated area or improve the condition of the existing area even though it be without consuming a single additional drop of water. All economy in the use of it, all benefits accruing from improved irrigation works constructed by Madras are to enure to the benefit of Mysore so as to entitle Madras only to a smaller quantity than before and thus save water more and more for Mysore. This is clearly a *reductio ad absurdum* and certainly could not have been the intention of the authors of the Agreement of 1892. In fact, it is the very fallacy sought to be guarded against in the passage already extracted (paragraph 32 of Ma. 7) from Doss on Riparian Rights, where the author observes that the reference to *user* as determining the *extent* of the prescriptive right "must not be understood to imply that the owner who has acquired the right . . . . must not enlarge the area under cultivation, for that would really prevent the growth of agriculture" (*vide* also the authorities extracted in paragraphs 34 and 35 of the above). The Durbar do not dispute the rules stated in these passages, but suggest a curious distinction (*vide* paragraph 13 of Appendix Q to their case), namely, that they refer to the enjoyment of a right that has been acquired but throw no light on the question how the extent of the user is to be measured. To begin with, it is not correct to say that they do not deal with the question of measuring the extent of user. It will be seen from the extracts themselves that they do relate to the question of the extent of the right acquired by prescription. But assuming the distinction suggested by Mysore,

what is the meaning of saying that the passages deal with the exercise of a right already acquired? And anyhow is that not the present case also? It is not that Madras had to acquire a right *after* 1890.

16. This is a fundamental fact that has frequently been pointed out in the Madras argument, but only to be quite as frequently ignored by Mysore in several parts of their argument. Thus, again, in attempting to distinguish the decision in *Commissioner of French Hock* v. *Hugo* (L. R. 10 Ap. Cas. 336), the Durbar observe that the case cannot apply "to cases of statutory prescription under which the enjoyment of the right must be within a definite period from the date of suit" (*vide* Appendix Q to the Mysore case, paragraph 9). But what is the "suit" here. And further why should we rely only on 20 years' user *after* 1890. As pointed out in the Madras rejoinder (Ma.-11, paragraph 6), suppose the present dispute had arisen in 1891 or 1895; could it have been contended that Madras had *no rights at all* because 20 years had not elapsed *since 1890*? It may safely be assumed that Mysore won't contend so. Take again the argument of the Durbar (in paragraph 8 of Appendix Q) that under the English Prescription Act the claimant of an easement "to avail himself of the statute" must show some act of user within one year of action and that (in paragraph 7 of Appendix Q) based on I. L. R. 26 Cal., 593, to the effect that, at whatever time the suit is brought the enjoyment must be found to have continued till within two years of the suit, and, if that cannot be found, the claim fails. These contentions overlook the fact that Madras are *not now for the first time* asserting their right founded merely on user since 1890, that we had considerable rights even before 1890 which were recognised by the Agreement of 1892 and which it was the very object of the Agreement to conserve. And it is from this point of view that stress was laid by Madras on the principle laid down by the Privy Council in *Commissioner of French Hock* v. *Hugo* that there is a difference between intermissions in or changes in the character of the employment of an easement *during* the time that it is *being acquired* (*i.e.*, when the *right is not yet complete*) and the same things happening *after* the right had been acquired, that the former would *prevent the acquisition of a right* but the latter may *not suffice to extinguish the existing right.* This is a fundamental difference resting on general principle and has nothing to do with any peculiarity of Roman-Dutch law.

17. If the Durbar can substantiate their contention that, since 1890 or 1892, Madras have *abandoned* their pre-existing rights, that will of course be a different matter. But, in dealing with the rule of prescription, we have to proceed on this footing, that we had certain rights even in 1892, which it was the object of the Agreement to conserve and the question is, is an extension of irrigation with the help of the same quantity of water as before in excess of our rights? If Mysore are right in saying that the right itself is measured by the irrigated acreage, *i.e.*, is confined to the water required for the particular acreage, how then can the dominant owner (even *after* the acquisition of the right) be entitled to use the water to cultivate a larger extent. But the authorities cited do clearly recognise such a right, and Mysore do not dispute that. Such a recognition is intelligible only on the footing that the extent of the right is to be measured "*with reference to the quantity of water claimed and used and not with reference to the acreage of land irrigated.*" This is the real point of the authorities and that is just the point that the Durbar choose persistently to ignore. They started with saying that the acreage is the sole test; they now maintain that at any rate it is the chief criterion. It is respectfully submitted that on the authorities it is not the *true* criterion. The Madras claim, stated in paragraph 18 of Ma. 7, is that we are entitled to have as much water as we have claimed and taken in the past for all purposes connected with irrigation and so long as we do not take more water than that, Mysore would have no reason to complain or take advantage of any particular works that we may construct or any extension of irrigation that we may be able to effect. This position, it is submitted, is the only reasonable view possible and is fully supported by authority.

18. This is perhaps a convenient place to dispose of an ingenious argument founded by Mysore on the language of the issues of reference (see paragraph 14, My. 9). It is urged that, if the real point for consideration *is the limit flow* that Madras are entitled to, apart from the extent of irrigated area, clause (*a*) of the

second issue would be unnecessary. It is difficult to appreciate this argument. Any one acquainted with legal procedure knows that issues are raised with reference to the *contentions* of the parties (whether right or not) and do not imply any kind of "decision" as to their correctness. And after all, what is it that the language of clauses (*a*) and (*b*) of the second issue suggests? Clause (*a*) refers to "the extent of the prescriptive rights of Madras." Clause (*b*) has nothing to do with prescription, but raises a different question, *viz.*, what must *now* be done to conserve the rights of Madras [as ascertained under clause (*a*)]. Surely, this contains no implication whatever as to the manner in which the prescriptive rights of Madras are to be *measured*. The argument sought to be drawn in the same paragraph from the first clause of the terms of reference originally proposed by Madras has as little substance. The clause refers only to "the requirements of existing irrigation." It pleases Mysore to read into it a limiting reference to "the existing irrigated area." If the clause is read, as it properly ought to be read, in the light of the claim put forward by Madras on that very basis (*i.e.*, the claim in Ma. 1), there can be no doubt that this is not what Madras meant by that clause.

19. It is interesting to note that Mysore are not prepared to own all the results which their contention must necessarily lead to. In their reply to the Madras rejoinder, the Durbar state that they "do not deny that Madras are entitled to the benefits of the remodelling works so far as they do not imply abandonment of the rights already acquired and so far as they are co-extensive with the prescriptive rights actually existing." This is truly enigmatic. What do they mean by the qualification "so far as they are co-extensive with the prescriptive rights actually existing?" According to them, the prescriptive rights are confined to the particular acreage already irrigated. What then is the benefit which Mysore would concede to Madras as the return for the enormous sums spent on improvement of irrigation works, if it is not to be by expansion of irrigation? The Durbar then go on to add "Mysore are entitled to claim the benefits of abandonment—which such works may reasonably suggest." This takes us to the question, what is the abandonment which the remodelling of the anicut *reasonably suggests* and of which Mysore can claim the benefit? There is no force in the implication which the Durbar seek to draw (My. 9, paragraph 15) from the mere fact that Madras claim only 7 feet and not the whole flow (as in the olden days when there were no improvements in the irrigation works). For, this limitation (to 7 feet) is due to the fact that for nearly 50 years Madras *claimed and took* up to 7 feet under the conditions then existing and that is therefore the extent for which Madras can claim prescriptive rights.

20. The Durbar rightly state that abandonment is a question of "fact" to be determined from all the facts and circumstances of the case (paragraph 13 of the Mysore reply), and as already stated they confine their plea of abandonment to the one foot flow over the Upper Anicut. What are the facts from which they want to draw the inference of abandonment? The only circumstance urged is the alteration made in the Upper Anicut from 1899 to 1902. The Durbar say that these alterations "*clearly* show that Madras intended to cease to enjoy the easement" (paragraph 16 of My. 6). But the reasons for the alteration have been explained by Madras over and over again, and do they show any intention on the part of Madras *to abandon pre-existing rights*? The Durbar do not dispute the proposition that abandonment is a question of intention, that is, the facts alleged should be sufficient to warrant an inference that the person entitled intended to give up his rights. It is confidently submitted that no such fact can be alleged or found in the present case. The Durbar really confuse the issue by adding practically in the very same breath (with the question of abandonment) the argument that the permanent alterations to the anicut have rendered the former user unnecessary. This is the basis of their argument of cessation of *easement of necessity* to be dealt with presently. But it is utterly irrelevant to the question of abandonment. It is characteristic of the Mysore argument under more than one head to obscure the real issue by mixing up the several questions of the extent of the user in the past, the manner of the user at present, the necessity for the same in the future, the propriety of the user in the past, the several modes of redistribution between the Cauvery and the Coleroon, and to jumble all up in fixing the extent of the prescriptive rights of Madras.

21. It is evident that it is in view of the illogicality of the position contended for by them on this plea of abandonment that the Durbar sought to have a second string to their bow by arguing that the one foot user over the Upper Anicut was " in law an easement of necessity " and that the right thereof " became extinct when the necessity thereof ceased as a consequence of the remodelling of the anicut " (My. 6, paragraph 15). The untenability of this argument was shown in paragraph 12, Ma. 11 of the Madras rejoinder, and Mysore now state that the rule as to easement of necessity was referred to only by way of analogy (see My. 9, paragraph 9). But the analogy is obviously unsound, for the very basis or reason of the rule (in the ordinary law of easements) does not admittedly exist here, and as before stated the rule of necessity or cessation of necessity has no application whatever with reference to *prescriptive rights.*

22. Reference is now and then made to *non-user* in recent years of this one foot flow. It is submitted that this has not been proved as a fact. But even assuming the fact to be so, it has already been shown that it is altogether a misnomer to apply here the term " non-user " in its legal sense. It cannot be contended that this extra one foot has not been flowing along the river and it will be idle to say that the water actually taken for irrigation is not from out of this one foot as well but *only* from the rest.

23. A considerable portion of the argument of Mysore on the question of the extent of the prescriptive right of Madras is altogether coloured by their view that it is to be determined not by the *actual* user in the past, but what according to mere opinion—whether it be of Madras officers or of Mysore officers or of the Committee of Arbitration—would have been proper user in the past, or at any rate would be necessary in the future. It is in this connection that opinions expressed and calculations made by Madras officers in connection with the preparation of the Bhavani and Metur reservoir projects are strongly relied on by them. It is submitted that such a theory of fixing the extent of a prescriptive right is unknown in any system of law. The argument derived by Mysore for this purpose from the words " fair and reasonable " in clause 3 of the Agreement is a perversion of the provision. It certainly could not have been intended that the extent of Madras rights to be safeguarded should depend not on the *facts* of actual user as proved, but on *opinions as to their propriety or necessity*, and there is nothing in the language of the clause to warrant the contention. We quite agree with Mysore that the question of extent of prescriptive right is a mixed question of law and fact and that the facts must first be ascertained and then the law applied. But the question of fact is, what has been the user in the past, not whether such user was proper and necessary or not. And as is established by the authorities cited in the Madras case (Ma. 7, paragraphs 34 and 35), the user is measured certainly as much by the *flow claimed as necessary* (though the opinion as to the necessity may be wrong) as by the quantity of water actually used in any particular year. Hence it is that reference was made to the Madras rules as showing their claim all along. As to the question of propriety, it must be remembered that in a sense all prescriptive rights are at their inception *founded on wrong*, such as trespass, etc. But the question of propriety or fairness is utterly irrelevant to the determination of the extent of a prescriptive right. To any lawyer, the proposition that a prescriptive right is to be measured with reference to an imaginary standard of fairness cannot but sound strange. As already pointed out, the words " fair and reasonable " in clause 3 of the Agreement can properly be held to refer not to the ascertainment of the *extent* of the right, but only to the mode in which the enjoyment of the rights so ascertained is to be secured.

24. As to contention (*b*) of Mysore (referred to in paragraph 7 *supra*), *i.e.*, that for five months (out of nine) there is no justification for the 7 feet claim, it has been already shown (paragraph 41 of Ma. 7) that on any principle known to the law of prescription there is no warrant for such a division of the year when the claim or user during the past was not in terms definitely so limited. The only argument urged by Mysore is that during those five months a supply of seven feet is not *necessary* and cannot be profitably utilised. As an allegation of " fact," this is denied by Madras. But even assuming it as a fact, the question of necessity can have no legal bearing on the question of the extent of our *prescriptive* right. The point has been discussed *supra.*

25. The same argument applies with equal force to the attempt of the Durbar to confine Madras rights to the *average flow* computed over a number of years. It will certainly be a novel application of the rule of prescription to say that, though the claim all along was for a certain *maximum limit flow* and such flow was enjoyed whenever it was available, the right to be founded thereon is to be cut down *for ever* because on some (or may be even many) occasions the water in the river did not come up to that limit. This will be in the very teeth of the numerous authorities cited in paragraph 41 of Ma. 7 which Mysore do not question.

26. It is, therefore submitted, in conclusion, that Mysore have shown no valid reason why on the basis of the long user of the past the prescriptive right of Madras should not be recognised to the whole flow of the Agunda Cauvery corresponding to a gauge reading of seven feet at the Cauvery Dam under the conditions existing prior to 1899 during the period June to February.

27. Taking now the alternative claim (referred to in paragraph 10 *supra*) by way of separated heads, *i.e.*, for the Cauvery (at the Cauvery Dam), for the Lower Coleroon system and the Veeranam tank, etc. With reference to the Cauvery Dam itself, the Durbar admit the prescriptive right of Madras only to a six feet flow. They admit that, as a matter of fact, seven feet over the Cauvery Dam has been flowing and has been required and used by Madras for a long time past. But they say that this would not support the prescriptive right to seven feet within the meaning of the Agreement, because it is only after 1896 that seven feet could have come to be used *for irrigation* and that prior thereto it was used " for purposes other than prescriptive use of water for irrigation." It must here be pointed out that the statement that seven feet over the dam *commenced* to be used for irrigational purposes only after 1896 is erroneous, and is due to a misinterpretation of the Madras rules of 1882 as to the regulation of water at the anicut. This extent of water had been used for the same purpose (*i.e.*, for being put upon the land itself) even prior to 1896. Madras also take exception to the Mysore view that the user of the seventh foot at the dam prior to 1896 was for purposes other than irrigation.

28. In connection with the other head of the separated claim, *viz.*, the supply claimed for the Veeranam tank, etc., it is necessary to draw attention to one mistake in the Mysore argument on this and connected questions. They take into account only the water regularly taken when the flow in the Cauvery is within the seven feet limit, but ignore the use that Madras made of flood water in times of freshes. This of course was not a steady source of supply, nor one regularly availed of. Undoubtedly Madras did utilise in the past a portion of the flood supply especially for the Lower Coleroon system ; and when it is now proposed by Mysore to impound the floods and cut off this source of supply, allowance must be made for the quantity of water that Madras used to appropriate in the past out of the flood water. The Mysore answer is that the Veeranam tank has got its independent catchment area and as part of the Lower Coleroon system will be sufficiently supplied by the water that they would concede to Madras over the Cauvery Dam. But when it was pointed out (Ma. 3) in justification of the Madras claim that the catchment area of the Veeranam tank is utterly disproportionate to the area dependent on the tank for water-supply, and that the Coleroon system has hitherto been having the benefit of flood supplies which will be cut off by the proposed Mysore reservoir, the Durbar merely re-assert that under *present* conditions a separate supply to the Veeranam tank is *unnecessary* and that, if suitable provision for delta irrigation is made, it will *ipso facto* cover the needs of Coleroon irrigation as well (My. 4). This argument does not really answer the question. One of the questions at issue no doubt is what will be " suitable provision " taking all items into account. But, as already shown, the question of the *extent* of our prescriptive rights, is preliminary thereto and must be determined on the basis of the user of the past and for this purpose the facts and figures connected with the supply claimed for the Veeranam tank are set out in paragraphs 35 to 41 of Ma. 8, paragraphs 33 to 35 of Ma. 9 and 72 to 98 of the Madras rejoinder (Ma. 12).

PART IX—FACTS AND ENGINEERING ARGUMENTS—SECOND ISSUE.

29. The matter raised in these paragraphs being purely legal has been already dealt with in Part VIII above.

Reference-Mysore paragraphs 12 to 14.

As regards Mysore statements in paragraph 13 regarding the Marikanave Tank project, it is altogether denied that the assent given by Madras to the construction of this reservoir can be made to bear the interpretation given it by Mysore. No notice was previously taken of the Mysore contention (paragraph 12, My. 6) as it was not then, and is not yet, suported by any evidence whatever.

30. Madras deny that there has been any abandonment of rights existing prior to remodelling.

Reference-Mysore paragraph 15.

This and the other matter contained in the first clause of paragraph 15 being clearly matters of law have been already dealt with in the legal arguments (Part VIII).

31. The claim put forward by Madras is based on the methods and quantities of actual use and enjoyment and on the application of the rules of regulation actually in force. The term "full and ample" quoted by Mysore from the first clause of the rules of regulation at the Grand Anicut of 1892 refers to the *average supply* which was considered ample by the framers of the rules and has no reference to *limit of useful supply*. The rules drawn did not limit the supply to be passed to this average although it was quite practicable to do so on all but three or four days a year in which floods in excess of about 200,000 cusecs are passing and yet the rules specifically enjoin passing into the delta far larger quantities than the supply noted as full and ample. The matter is dealt with in greater detail in Ma. 12, Part VI, paragraphs 35 to 45.

32. Madras have not urged that disrepair of works would entail acquisition of right to additional water, but have stated that if, as argued by Mysore, improvements affecting economies entailed loss of prescriptive right to the original quantities of water, the reverse proposition would necessarily also hold. Mysore have now, however, stated they do not deny that Madras are entitled to the benefit of the remodelling works, that is, of the improvements carried out by them.

Reference-Mysore paragraph 16.

33. The quotation made by Mysore is not a fair representation of what Madras stated in paragraph 10, Part VI, Ma. 12. It is there stated that although 176,334 acres were cultivated prior to 1890 the suggestion that the area of cultivation was limited to this, is denied. The suggestion by Mysore that, because some details and records of cultivation going back over 20 years are not forthcoming, the inference is that the cultivation was non-existent, is denied.

Reference-Mysore paragraph 17.

All the channels for which records cannot be produced are old channels constructed and in full use for many years before 1890. Madras claim that the amount and mode of user for the irrigation above the Upper Anicut has not been increased since 1880, and that any scattered minor extension of areas of irrigation which has taken place since then, has been due to greater efficiency in control and distribution of the water to which there is prescriptive right.

34. The total area under the Vadavar and Veeranam tank combined is 63,000 acres and, this being so, it is quite immaterial to the matter at issue whether this is divided up into—

Reference-Mysore paragraph 18.

(11,000 acres under the Vadavar direct,
(52,000 acres under the Veeranam tank,

or

(17,000 acres under the Vadavar direct,
(46,000 acres under the Veeranam tank.

It is regretted that the information asked for on the subject has not yet been received.

35. The records of areas of wet cultivation between 1880 and 1890 are incomplete. The details which are available are abstracted in Appendix XXI.

Reference-Mysore paragraph 19.

The original file on the subject is open for reference.

36. The legal aspects of the matter advanced by Mysore in paragraph 20 have already been fully discussed in Part VIII above.

Reference-Mysore paragraph 20.

The whole of the principal works on the Cauvery both in Mysore and Madras are diversion works, and aim at controlling, to the greatest extent deemed economically feasible, the distribution of the total water received in the proportions best suited to the conditions of use required. It is altogether denied that there is any obligation on the Madras Government to restrict any part of the water to which they have right to any particular area.

It is altogether denied that diversion of water to which Madras has right from the Coleroon to the Cauvery delta system or *vice versa* imposes on Mysore any more onerous burden and no proof or argument in support of this contention has been adduced. What has to be decided is the limit incidence of flow in the Agunda Cauvery below which interference or interruption of the natural flow would constitute an infringement of the existing prescriptive rights of Madras, and this limit has to be fixed on a consideration of the whole conditions and necessities of Madras irrigation and existing modes of enjoyment not only for the Cauvery Delta system and Coleroon Lower Anicut system but for the system of irrigation channels between Bhavani and the Upper Anicut.

The circumstances and conditions of irrigation of the whole of the irrigated tracts must be considered as a whole, and it is impracticable to take any part of the system and consider it an altogether separate and independent entity from another part. It is reasonable and proper to consider and study separately the conditions and requirements of irrigation supply for various tracts irrigated under different limiting conditions; but, in finally giving a finding under the second issue, all the circumstances of the whole combined system must be considered and the limit fixed in such a way as to safeguard the existing prescriptive rights of the whole considered as one system.

The proposition of Mysore is altogether untenable.

37. There is no objection to considering separately the requirements and conditions of supply of the Cauvery and Coleroon systems in the first instance. The final decision to be arrived at is the limit flow in the Agunda Cauvery at the Upper Anicut to which Madras is entitled, having in view the requirements of the whole system of irrigation both above and below that work.

Reference-Mysore paragraph 21.

The whole of the Mysore arguments as regards the supply of the Coleroon are directed to attempt to prove that no specific supply is required for the Coleroon system and that adequate supplies would be received by percolation, seepage, etc., from the supplies passed to the Cauvery Delta, and yet in this paragraph they state that the requirements must be considered under two distinct heads and the quantities of water required for one must not be mixed up with what is required for the other.

Requirements of Cauvery Delta.

38. The requirements of Madras for purposes of the Cauvery Delta irrigation alone prior to remodelling of the Upper Anicut included three necessities—

Reference-Mysore paragraph 22.

(*a*) water for irrigation passed over the Cauvery Dam,

(*b*) water for scouring which passed through the under-sluices of the Upper Anicut,

(*c*) water necessarily passed over the Upper Anicut to keep up the level required over the Cauvery Dam.

While (*b*) and (*c*) was not passed on to the fields in the Cauvery Delta, they are a necessity for securing the supplies and ensuring the conditions of river bed

and are necessary for irrigation of that area and in use and enjoyment for that purpose.

Further, the water so passed into the Coleroon in the interests of the Cauvery delta area was again used for the irrigation of the Coleroon Lower Anicut irrigation and therefore doubly used.

The necessities of allocation and use of water for scour have been explained in Madras, Part II, paragraph 30, Ma. 8 and Part III, paragraph 9, Ma. 9.

The necessity of scour, however, has been much more strongly urged by Mysore than by Madras—*vide* My. 7 (Part II, paragraphs 40 and 41).

On both hands the necessity of scour is admitted.

This being so, there is prescriptive right to water for scouring. The conditions and rules of 1882 prescribe the opening of the under-sluices for scouring at all times when 7 feet or over is passing the Cauvery Dam, and except in times of scarcity, when 6½ feet is passing, and the Madras claim has been limited to the flow required to give 6½ feet with under-sluices open which is equal to the flow required to produce 7 feet with under-sluices closed.

The necessities of scour are admitted by both parties and it is quite open to argument that Madras rights embrace water for scouring with a 7 feet gauge reading. It has been considered, however, that the water due to 7 feet without scouring under the conditions prior to 1899 will, under existing conditions, protect Madras irrigation and the claim has been limited to 6½ feet with under-sluices open or 7 feet with under-sluices closed.

The former figure on the reading of the rules of 1882 is clearly within the Madras rights, while the mode of actual user fully supports the rules.

39. No such admission as is claimed by Mysore in the last three lines of this paragraph has been made and the suggestion that the magnitude of the works of Mysore does not affect Madras is obviously unfounded. The fact that Madras have assented to the construction of a small reservoir but refuse assent to a large one alone, negatives the suggestion made.

Reference-Mysore paragraph 23.

40. Mr. Larminie wrote in 1900 and at that time according to the rules then in force for four years, the lowest level at which under-sluices might be opened was 7 feet, while the actual regulation followed these rules. From 1882 the rules had enjoined never opening with a gauge of less than 6½ feet, and not opening after any scarcity with less than 7 feet, while the actual user under these rules had the effect of not opening before 7 feet was attained more often than opening at 6½ feet. In the face of this, mere opinion can have little value. The value of expert evidence as against evidence of actual rules may best be realised by considering what value would be placed on expert evidence which laid down as a necessary supply a limit which was in excess of that enjoined by the rules and actual use.

Reference-Mysore paragraphs 25 and 26.

41. The Government of Madras base their claims on facts, *viz.*, actual evidence of enjoyment and rules of regulation and submit that expert opinion has no value when conflicting with such actual proved facts.

Neither the rules of 1882 at the Upper Anicut nor those of 1892 at the Cauvery-Vennar regulators, support the interpretation put by Mysore on Mr. Larminie's statements.

42. The rising of the top level of the gates did not prove that the previous limit useful supply was 6 feet but the raising as well as actual gauge readings and rules prove the contrary.

Reference-Mysore paragraph 27.

The previous useful supply was 7 feet and over up to 8 feet and the raising of the level clearly proves that it was considered desirable to pass 7 feet and over up to 8 feet more frequently than could be done under the previously existing conditions.

This is the only object which could have been served by raising the level of the top of the shutters. The other improvements to be effected by remodelling would equally well have been served with 4 feet shutters which would have been much less costly to instal.

43. The argument of Madras is that, under the rules of 1882, the enjoyment of a flow exceeding useful limits was of frequent occurrence. The conditions then, unlike the conditions now, entailed drawing rules in view not only of supply but of risk of excessive water.

Reference-Mysore paragraph 28.

Under these conditions, a limit of 6½ feet in times of non-scarcity can be well understood in view of the liability to flooding which could not be excluded. Madras agree that it is rather to the new conditions and rules after full control was obtained that one must look to gauge what water has been taken *with intention and for purpose of use.*

44. As regards (*a*), Madras agree to the proposition that before construction of the Cauvery-Vennar regulators the quantities of water entering the Cauvery delta were subject to only very limited control.

Reference-Mysore paragraph 29.

As regards (*b*), Madras deny that, after the regulators were constructed, it was necessary in protection of the regulators involuntarily to pass extra water into the Cauvery and Vennar.

This was necessary only on a few days and the occasions when it was necessary have been shown in Appendix XVIII (Ma. 12) for the years 1900 to 1908 and total to eleven occasions in all.

It is the record of gauge readings and consideration of rules in force after the present control was established that give a measure of the water passed *with intention and for purposes of use* into the delta.

45. It is absolutely denied that a 6 feet gauge could not be secured consistently with the opening of under-sluices. No competent man who wished to scour as soon as water could be spared and who could spare water with a 6 feet gauge would make such rules as those of 1882 to secure this. He would, as soon as water rose to 6 feet, open the under-sluices gradually and regulate the opening so as to maintain water at as near 6 feet as was possible with the sluice power available. The intention of the rule was clearly that 6½ feet always, and in times of scarcity 7 feet, should be passing over the Cauvery Dam and was required for supply before any water was to be allocated to scour. The matter is clearer from the fact that water passed for scour with a 6 feet gauge is more efficient than a similar quantity passed with a 6½ feet gauge and had the object of the 1882 rules been only to maintain 6 feet and use the balance of water for scour, the rule was clearly defective and not calculated to produce the result required in a reasonably efficient manner.

Reference-Mysore paragraph 30.

46. The seven feet flow was not, as stated by Mysore, only after remodelling, fixed as the minimum limit flow before opening sluices in the Upper Anicut, the limit was fixed absolutely without exception from 1896, while from 1882 the 7 feet flow was the limit which applied to more than half the occasions of opening undersluices. The Upper Anicut was remodelled because the advances in engineering facilities and appliances had placed at our disposal methods of control much more efficient than had been previously in use. There is little doubt that such a work as the present Upper Anicut would have been built by Sir A. Cotton in 1836 if this had been practicable in those days.

Reference-Mysore paragraph 31.

The accumulations of sand above the Upper Anicut gave trouble from the time of the construction of the Upper Anicut in 1836. On this account, the under-sluices were constructed in 1846. There is nothing to show or to lead one to believe that the Upper Anicut was reconstructed on account of any recent developments of a grave nature or that the construction has materially altered the state of the sand deposits at the head of the Cauvery. The rules of 1896 were recast in 1905, but no alteration of the 7 feet limit was then made, while a study of the actual regulation shows that as much as 7½ feet is forced frequently into the Cauvery intentionally, and occasionally even more, when it could be safely and easily passed into the Coleroon. Such extra supplies are authorised by the rules to be ordered by the Executive Engineer and the record shows that they are actually occasionally passed when available, especially between the middle of July and the middle of September, to supplement the ordinary 7 feet limit.

The Mysore contention that the 7 feet limit was fixed to provide for temporary and abnormal conditions is pure conjecture, and it is also pure conjecture that the conditions making it necessary have ceased to exist, and this is altogether denied.

Reference-Mysore paragraph 32.

47. It does not need the aid of Kennedy's theory to enable an engineer, who considers the conditions of the Upper Anicut with gauge readings between limits of 6 and 7 feet, to realise that scour efficiency diminishes as the water level increases. Kennedy's theory is useful in enabling definite figures and critical velocities to be quoted. As a general proportion the condition of scour efficiency is quite clear to any engineer, who considers the conditions, quite apart from the theory of critical velocities advanced by Mr. Kennedy. The proposition was originally advanced with confidence by the Madras Engineers without any consideration of Konnedy's theory, and under the then existing conditions and limit of gauge readings; it is submitted that there could have been no obscurity or uncertainty about it at the time the rules of 1882 were framed.

The last clause of this paragraph which is stated to be a fact by Mysore is altogether denied by Madras and is not supported by either proof or probability and imputes by inference careless neglect and wasteful use of water to the framers of the rules of 1882.

Reference-Mysore paragraph 33.

48. The title of Madras to water for scour is dealt with in parapraph 38 above.

The discharges of paragraph 29, Part VI, Madras 12, are reproduced here for ready reference in million cubic feet per day—

Gauge	Over Cauvery Dam	Over Upper Anicut	Through under-sluices	Total
Six feet	1,625	86	669	2,380
Six and a half feet	1,950	366	725	3,041
Seven feet	2,300	644	Sluices closed	2,944

The rules of 1882 enjoin not opening under-sluices till 6½ or 7 feet is realised according to the state of previous supply and closing when the gauge falls to 6 feet. That is, when the gauge falls to 6 feet, the under-sluices will be gradually closed so much as is necessary not to allow it to drop below 6 feet.

The Mysore contention is that 6½ feet was only inserted in the rules because when the under-sluices were opened the level would fall 6 inches to 6 feet.

The contention now is that at 6 feet the under-sluices should be closed. Great stress is placed on the admitted necessities for scour. When is scour water to be allowed? The Madras Government's contention is that 6½ feet with scour is the minimum of their prescriptive rights. Mysore advance 6 feet as the limit required by the rules. They insist on the paramount necessities of scour. Under the rules the minimum amount of water which allows both 6 feet and scour is, as stated in Madras paragraph 29, Ma. 12, 2,380 million cubic feet per 24 hours; this quantity is slightly more than the equivalent of 7 feet on the Cauvery Dam under existing conditions with all sluices of the Upper Anicut closed. It is unreasonable to say 6½ feet is only required for purposes of getting scour water and still maintaining six feet, and also that with six feet scour water was not used; yet this is the argument advanced by Mysore.

Reference-Mysore paragraph 34.

49. There is no such admission implied by Madras in their paragraph 30 as is stated by Mysore.

The legal points raised have been dealt with in Madras Part VIII above.

Reference-Mysore paragraph 35.

50. The contention of Mysore is that water used for scour although admittedly required for use for this purpose before remodelling may not be used for any other purpose. Scour, however, is certainly a purpose intimately connected with irrigation and

water required for scour is as necessary as is the water in a channel which is needed to raise the level of the water so as to make channel irrigation possible. It will be a very unnatural and unduly restricted interpretation of the agreement to confine the rights of Madras to the water actually put upon the land itself. The purposes of irrigation necessarily mean and include all purposes incidental thereto, and further, as already pointed out, the water used for scouring itself finds its way into the Coleroon system and was not without use for irrigational purposes there. It is urged on behalf of Mysore that, after the improvements in the anicut, scouring is no longer necessary. This is not correct. But, however that be, is that any reason why Madras should lose their right to the water hitherto used for that purpose? Why should Madras not use it for extending or improving their own irrigation? Is it not really denying to Madras the benefits of all improvements effected by them, if they are to be told that they cannot use that water for any other purpose? Surely, there can be no question of abandonment here as Madras have all along been claiming and planning to use that water for some useful purposes. The Mysore argument under whatever head advanced after all comes back to and hinges on the assumption that Madras can claim as of right not the usual quantity of water but only such quantity as may now be necessary for the former irrigated area.

The necessity for scour does not cease with the reconstruction of the Upper Anicut; with the shutters down, the silt will still accumulate in front of this work. Scouring is still and will always be a necessity and now as at all times since 1896 has been practised as soon as flow in excess of 7 feet on the Cauvery Dam is realised.

The conditions and efficiency of scour during floods are much improved by the remodelling, but the incidence of floods especially in bad years will be greatly affected by the proposed Mysore Reservoir.

51. The Mysore statement that the rules of 1882 were not strictly observed is denied and the instances quoted as showing non-operation of the rules are instances of "operation of the rules." The claim of Madras is that under the operation of the rules of 1882 it was more usual for the under-sluices to be kept closed till a gauge reading of 7 feet was realized than to open them with a lower gauge and this supports their claim to 7 feet whenever required—*vide* Ma. 8, Part II, paragraph 30 and Ma. 9, Part III, paragraph 8.

Reference-Mysore paragraph 36.

52. There appears no reason to believe there was error in the passage quoted which is Major Oakes' description of the 150 yards calingulah in 1873.

Reference-Mysore paragraph 37.

The discharge, 32,130 cusecs, mentioned by Major Oakes may have been erroneous, but does not differ greatly from that of Captain Mead's discharge curve of 1866 which stated quantities very greatly in excess of what was actually passing.

A note (Appendix XXIII) shows the circumstances under which the discharge curve of 1866 differs so much from that of Major Montgomerie and from the discharge curve based on actual gauging.

The 150 yards calingulah as already stated in paragraph 34, Part VI, Ma. 12, was built to supplement the Upper Anicut and the intention was to have the crest at about a level corresponding to that of that work.

53. The supply of 17,344 cusecs is not the limit of flow to be admitted to the Cauvery and Vennar under the rules of $\frac{1892}{1888}$.

Reference-Mysore paragraph 38.

The full and ample supply alluded to in rule 1 is much below the limit of flow which the rules specifically direct shall be admitted to the Cauvery and Vennar, whenever available and, as already explained, it refers to the *average flow* which was considered a suitable full supply for the areas to be irrigated, that is, the supply which, if given every day as a steady flow, would, it was considered, suffice.

It is not stated or claimed by Madras that the maximum discharges enjoined to be passed into the Cauvery under the rules of $\frac{1888}{1892}$, that is, discharges up to a level of 7½ feet, were all required for irrigation; it is, on the contrary, stated that they

were partly fixed by the conditions imposed by the falling shutters installed on the Grand Anicut—*vide* Ma. 12, Part VI, paragraph 39—and it is further stated that the rules which were in force till 1902 did not enable one to judge from the evidence of the rules what was the maximum quantity of water which was admitted *for supply* into the delta.

The rules of 1902 were the first drawn under conditions not involving "falling shutters" and in these it is laid down that the level of water to be by rule admitted through the Cauvery regulator before opening the Grand Anicut sluices is limited to 6·2 and in the Vennar to 8 feet, and it is considered that this defines the approximate limit of useful supply. This totals to 31,090 cusecs. It is not put forward or suggested that this supply is required, or even desirable, if passed continuously from day to day for weeks together, and the limits claimed by Madras do not suggest this, nor do the conditions of natural flow connote this.

What is advanced by Madras is that 7 feet at the Cauvery Dam shall be passed whenever available and that occasionally for a few days extra supplies up to 7½ feet are actually passed and required for irrigation of the Cauvery and Vennar under existing conditions and have been so used for many past years.

It may be noted that the normal limit supply to the Cauvery and Vennar combined under the 7 feet limit at Cauvery Dam would be about 24,000 cusecs at the regulators, allowing for surplus over 150 yeards calingulah and draw off and loss in transmission. This connotes a gauge reading of 5½ feet in the Cauvery and 7 feet in the Vennar taking the quantities from the curve of discharges suggested by the Assessor. In column 9, Appendix XXIV, the discharges into the delta due to such gauge limits are shown.

Reference to the tables of rear gauge readings of the Cauvery and Vennar, Appendix II (Ma. 8) and Appendix XVIII (Ma. 12), clearly shows that such gauge readings are in *constant* use and that also higher gauge readings have been in occasional use from the time when effective control was first established.

Previous to such dates the high gauge readings were higher, but as these were not wholly controlled by the requirements of supply the conditions do not admit of argument of use and necessity being applied with the same force in their case.

54. The conditions involving the use of the Cauvery and Vennar as flood carriers only occur seldom, not on an average on three days a year, but they do sometimes occur. The actual days on which they have occurred are given in Appendix XVIII. Madras deny the general statement that the rivers are in frequent use as flood carriers and that the gauge readings enjoined by rule, or carried on the orders of the Executive Engineer, were carried for flood disposal purposes or for security of the regulators.

Reference-Mysore paragraph 40.

General statements that this is so are not proofs. Madras have stated on what days water was carried at a high level involuntarily on consideration of flood and security, and any rebutting statements should, it is submitted, be equally specific.

55. The statement here made by Mysore is not borne out by the rule 2 of 1902 which specifically enjoins proportionate distribution, and not distribution by turns. The record of actual distribution was made in accordance with these rules. The rule cannot bear the interpretation put on it by Mysore.

Reference-Mysore paragraph 41.

56. The rules of 1905 delegate to Executive Engineers powers of regulation giving certain standards to be worked to by the local staff in the absence of specific orders.

Reference-Mysore paragraphs 42 and 43.

Under these conditions the measure of use is the gauge readings actually maintained under such system of control and these are displayed in Appendix VIII (Ma. 8) and Appendix XVIII (Ma. 12).

It may be noticed, however, that under the application of the Assessor's curve the discharges are :—

	Cusecs.
4½ feet, Cauvery	14,000
7 feet, Vennar	7,600
	21,600
Add—discharge over 150 yards calingulah draw off and loss in transmission by seepage, etc.	1,800
	23,400

This is equivalent to 6·6 feet normal discharge of the Cauvery Dam. Thus, even accepting the contention of Mysore as regards 4½ and 7 feet limit at the regulators, the Madras limit would be 6·6 feet on the Cauvery Dam.

The records, however, show that the actual user for irrigation was materially more than the above and was generally 7 feet on the Cauvery Dam when available and not infrequently the equivalent of 7½ feet and even more.

57. As shown already, the regulation of the Cauvery and Vennar entailing high gauge readings is only due to flood conditions on an average less than three days yearly, and mere statements to the contrary cannot be taken as proof that it is otherwise.

Reference-Mysore paragraph 44.

The moment the question is put as to why it was either necessary or desirable in the interests of safety, or flood regulation, on any day not specified already in Appendix XVIII to pass a high supply, there is no reply to be given.

In view of the liability to loss of crop under both Cauvery and Vennar by submergence in the vicinity of the coast, it would obviously be foolish to pass into the delta large quantities of water if these supplies were not required. While it is not suggested that prior to the introduction of the rules of 1902, that is, in the "falling shutter" period, all water passed was intended for supply, this is maintained as regards the period after that date, and rules and records support this contention. It is for those who deny it to give specific proof in support of such denial.

58. Madras have not suggested the throwing of their rules overboard, but they have suggested that, if the methods of user were shown to be consistently at variance with the rules, then the latter and not the rules, are the best evidence of use, and therefore would have preference as evidence.

Reference-Mysore paragraph 45.

In the case under consideration, there is no conflict between the rules and the methods of user, for it is necessary to refer to the records of user to see to what extent the permissive clauses in the rules have been availed of.

Further, where there is a doubt as to the meaning and intention of a rule, it is from the record of actual user that this doubt may be set at rest.

59. Major Oakes was writing in 1873 before the Cauvery and Vennar regulators were built and when the Vennar head was an off-take from the Cauvery 3 miles above the Grand Anicut.

Reference-Mysore paragraph 46.

There can be no doubt that what Major Oakes meant was that 17,600 cubic feet of water passed down the Cauvery at the Grand Anicut excluding the Vennar with water just at the crest of the anicut and by raising the water 2 feet by means of shutters, 23,650 cubic feet of water would be forced down the Cauvery.

As regards the actual quantities, it is likely that Major Oakes may have been in error, but as regards gauge readings there is no room for error.

The Vennar in those days used to get a very bad supply with less than 6½ feet on the Cauvery Dam, and it is probable that under the conditions represented the off-take of the Vennar would have been only some 5,000 or 6,000 cusecs.

The crest of the Grand Anicut has not been altered and that crest level is 4·67 feet above the cill of the Cauvery regulator at which level is the zero of the gauge.

Thus, Major Oakes gave 17,600 cubic feet as the discharge of the Cauvery with a gauge of 4·67 feet. The Assessor's curve gives a figure for 4·7 feet of 15,000 cubic feet, and it appears probable that Major Oakes' figure was excessive.

The discharges at the Cauvery Dam in 1873 used to be generally taken from Captain Mead's curve of 1866 which gave for a gauge reading of 6 feet, a discharge of 24,515 cusecs—*vide* Appendix XXII which was much in excess of the true discharge owing to the use of an unsuitable formula. The discharge of the Cauvery at the Grand Anicut may have been computed in a similar manner.

The discharges may be wrong, and probably were so, but the gauge readings are not open to doubt or dispute.

60. The Madras point as regards the conditions at the Grand Anicut in 1873 is that it was then necessary, at some risk and disadvantage, to maintain dam stones and planks for forcing down the Cauvery 2 feet extra depth of water, when 4·67 feet could be obtained without any such device.

The Vennar head being 3 miles up, the planks and dam stones were used solely in the interests of the Cauvery and could serve no other possible purpose.

This is the very strongest evidence of the necessity and intentional use of 6½ feet of water in the Cauvery as far back as 1873 and this is a very strong proof of the Madras contention on this matter. This further clearly disproves the full and ample nature of a 4½ feet supply, if such 4½ feet is considered to be a limit and not, as really meant, an average supply.

Reference-Mysore paragraph 47.

61. Madras adhere to their claim as regards the limit of water required at the Cauvery Dam.

Reference-Mysore paragraph 48.

62. The matter is clear as regards the Metur Project gauge readings. Mysore allow *limit gauge readings* on natural flow 25 per cent. higher than the Metur project *average gauge readings.*

This does not give 25 to 30 per cent. more supply than the Metur Project or anything at all approaching to it.

Reference-Mysore paragraph 49.

63. As regards the inaccuracy of the discharges recorded in Madras records, the table, Appendix D, speaks for itself. There appears no question that the figures are so incompatible with each other that they cannot all be correct. It has always been stated by Madras that their discharges were unreliable with the exception of those at the Upper Anicut and at Bhavani bridge, which are based on the gaugings and computations of 1909.

It was the known and proved unreliability of the recorded discharges that led to the gaugings of 1909 being instituted, which gaugings necessitated the delay of a whole year in the preparation of the Metur Project.

Mysore here allude to the alleged *inaccuracy of Madras discharges.*

Is the inference that Mysore consider them accurate? The figures in Appendix D alone make it clear that they cannot be so.

As regards the use of water in June, Madras contend that the records of regulation at the only two places where regulation will avail in passing, or not passing, water into the delta (*viz.*, the Upper Anicut and the Grand Anicut) show that the freshes of June were, as a rule, passed into the delta when received. The fact of seldom receiving any considerable quantity of water in early June is not a reason for depriving Madras of their undoubtedly existing right to the enjoyment of the early freshes when received up to the limit of flow laid down in the existing rules.

Reference-Mysore paragraphs, 50 and 51.

64. As regards absorption in canal and channel beds, the first freshes must be to a great extent used to fill up the porous sub-soil and margins of the river and channel beds. It is futile to say water for this is not required below the Upper Anicut as it is obvious the necessity exists in all channels with porous beds of which there are many hundreds of miles.

Further, when water is first run on to fields, the absorption is very great and this is especially so in the early part of the season as rainfall in June is scanty.

The custom of Madras is to use the first freshes after the beginning of June to fill up the rivers and delta channels, and their claim is to the continued enjoyment of this right.

The computation by Mysore is altogether at fault. First, the computation of Madras for the absorption of 1 mile of channel 1,000 feet wide is reduced by one-third for no stated reason, although Madras computation is based on clearly defined data. The computation is then applied only to the river above the Upper Anicut which is, it may be remarked, of much greater mean width than 1,000 feet and probably nearer 2,000 feet.

The area of river and channel beds below the Upper Anicut which is fully ten times as much as that above is ignored. It is especially to filling up the delta rivers and channels that the early freshes of June are applied. It is clear that water for filling these must be supplied before the channels become efficient means of carrying water. The computation by Mysore might be multiplied by twenty and still be found quite inadequate to fill up with water the sandy beds of the delta rivers and channels.

It is to be realised that the system is one in which drainages and natural rivers are used for irrigation and the area of bed of the sources of irrigation is three or four times as great as in a modern system designed for carrying only irrigation supplies. In the month of June, every river bed and margin sucks in water like a sponge and a reference to the discharges over the Cauvery Dam and at the Upper Anicut in the first half of June (Ma. 9, Part III, paragraph 38) gives some idea of the way water is lost in this month in even that short, though wide, length of river bed. The discharges at the Grand Anicut are, it is admitted, open to accusation of unreliability, but they are at least on as strong a basis as those at the Lower Anicut.

65. It is submitted that Mysore have not met the Madras contentions and that the limit flow which is suggested by them does not give even an approximation to the protection to be given under the terms of reference, *viz.*, *the maintaining unimpaired the prescriptive rights of Madras.*

Reference-Mysore paragraph 52.

66. The statement here made that the position taken up by Madras is directly opposed to what law and equity permit, is denied.

Reference-Mysore paragraph 53.

The subject matter of paragraph 53 (My. 9) being purely legal, it has been taken up and replied to in Madras Part VIII.

67. The matter of remissions due to submergence in the worst supply year on record, 1899-1900, has been examined.

Reference-Mysore paragraph 54.

Of the total remission in 1899-1900 in the Tanjore delta, 54·4 per cent is recorded as due to submergence.

It will be seen that the loss due to submergence is a little more than half the total remissions.

As the year 1899-1900 was noted not only for failure of river flow, but also for failure of the rainfall in the north-east monsoon, the records of rainfall have been tabulated for all the stations in the delta along the coast, south of the Coleroon and east of the Mayavaram-Muttupet Railway, from 1st October to 10th January, with the following results, the months being divided into three periods:—

Months.	1st to 10th.	11th to 20th.	21st to end.
October	0·04	4·87	22·41
November	2·02	2·09	2·99
December	1·11	1·76	0·02
January	*Nil.*	...	...

The above represents the rainfall along the coast the rainy zone of the delta in which the losses by submergence always occur.

It will be seen that the north-east monsoon rains were very much below normal throughout the period except in the last part of October when the rain was very heavy, over 22 inches falling in ten days.

The great remission by submergence in this year of drought can be now explained in view of the conditions examined.

The year was throughout one of deficient river supplies, and transplantation at the tail ends of the channels near the coast was in consequence behindhand. As always happens under such conditions as a result the crops were quite young when the torrential rains of late October fell and all the young crops were submerged and totally lost.

It will under this explanation be realised that, although the statement in the Madras triennial report quoted by Mysore is literally correct, it is nevertheless misleading. Generally, with regard to paddy total submergence of the crops for some days destroys the crop, but it is not injured if the head is not submerged. Thus, when the crop is high, the same amount of flooding as will totally destroy a young crop does little or no damage.

It is common after loss of crop by submergence for the area to be replanted and cultivation started afresh and under such conditions a crop is frequently obtained. In 1899 the supplies of rain and river water after the end of October was so deficient that this could not be done and thus the area destroyed by the October rains obtained remissions for submergence, and thus in the year when supplies were the lowest on record, remissions for submergence as well as also for deficient supply were the greatest recorded.

Remission for submergence is very common in lands lying along the coast in the taluks of Mayavaram, Negapatam and Tirutturaipundi, especially in the first and last named. This is invariably caused by the torrential rainfall in the north-east monsoon which is especially heavy along the coast. The drainage difficulties are great as outfalls into the sea become inefficient during periods of low flow and bars form across them. Further, from time immemorial, irrigation water and drainage are carried into the same channels and, as efficient irrigation calls for water running at a high level, and efficient drainage, the reverse liability to submergence along the coast after torrential rain is great. Statements of remissions in the delta for 20 years which have lately been received from Collectors have been found to display such glaring discrepancies on comparison with recorded rainfalls and river discharges that they have been referred back for scrutiny and explanation. The information asked for by the Arbitrator on the subject will be furnished at the earliest possible date.

The fact that there is constant liability to loss of crop by submergence, due to the torrential rainfall of the north-east monsoon which is of a cyclonic character, does not entail absence of loss from deficient supply even in the same tracts during other parts of the period during which the crop is on the ground, while it is quite common for the crops in the eastern parts of the delta to be suffering from submergence while those further west are suffering from deficiency of supply.

It may be noted that roughly speaking crops suffering badly from submergence are totally lost and the losses from this cause are more nearly fairly represented by the area on which remission is granted than is the case with losses from deficient supply.

The yield is very frequently affected by deficient supply without any total loss being suffered and of the area on which remission is given for deficient supply is no measure whatever of the area which has severally suffered on this account. Remission is only given *for total loss of crop* and no remission is given even on a 2 anna crop.

68. Sir J. Benton drew his inferences from the rules of regulation actually in force at the Upper Anicut and the quantities of water subject to the seven feet limit laid down in those rules was the quantity he considered, was required for the Cauvery delta.

Reference-Mysore paragraph 55.

It is altogether contrary to fact to state that Sir J. Benton neglected the rules of regulation in drawing his inferences. It has never been suggested by Madras that Mysore should not impound when a flow is secured to Madras up to the limit claimed.

69. These contain irrelevant statements outside the scope of the issue now under consideration, which is concerned solely in deciding the flow in the Agunda Cauvery at the Upper Anicut which will preserve unimpaired the existing rights of Madras.

Reference-Mysore paragraphs 56 and 57.

70. This is a general statement and contains no new argument requiring to be met.

Mysore paragraph 57.

71. This paragraph of Mysore involves consideration of the figures contained in Appendix V of Sir J. Benton's note of the 12th May 1911 (page 50, Ma. 8-a) and this matter is taken up here before dealing with Mysore contentions.

Reference-Mysore paragraph 58.

The matter of these figures has been previously dealt with in Ma. 12, Part VI, paragraphs 61 to 63.

It is there stated (paragraph 61) that the endeavours made to trace the source of the figures in column 10 had failed and further (paragraph 63) that the basis of crop period, columns 3 and 4, could not agree with the basis of average discharge, columns 5 and 6, as otherwise there could be no discrepancy of totals as the method of computation was correct. Further search has resulted in discovery of the basis of the figures for nearly all the period and the matter is made clear in Appendix XXII. The results show that the inference in paragraph 63 was quite correct. The basis of the figures is now clear and they work up, with the exceptions stated, to the figures of discharges given in the Madras annual river diagrams.

The question of the accuracy of these latter figures has been taken up in paragraphs 67 and 68 of Part VI, Ma. 12, and has been dealt with by the Assessor before whom and the Mysore Representative all the initial records which could be found on the subject of the methods of computation were laid. The Assessor has drawn out a curve and table of discharges based on it which he considered would fairly represent the discharges of the Cauvery and Vennar as obtained from the record of rear gauge readings [Ex. A-4 (b)] and intimated that any arguments put forward having as a basis the discharges of the Cauvery and Vennar below the regulators would be considered to be fairly stated if based on these discharges. In accordance with this, Mysore have based their table, Appendix G.-1 (My. 9), on this curve, while Madras have recomputed all their discharges for Cauvery and Vennar for years 1890 to 1909 from the same curve.

In the statements which follow, the discharges of Cauvery and Vennar are from this revised computation.

72. The contentions of Mysore in paragraph 64, My. 7, were met in the rejoinder of Madras Part VI, paragraph 70, Ma. 12, only by denial of the reliability of the figures in Appendix V of Sir J. Benton's note.

Reference-Mysore paragraph 58, My. 9 and paragraph, 64, My. 7.

It is now, however, possible to go into the matter more in detail using the figures of discharge from the Assessor's curve in correction of and comparison with the inaccurate figures in column 10, Appendix V, in the above note. The totals of figures at the foot of the columns, Appendix G, My. 7, are reproduced in columns 4, 5, 6, Appendix XXIV, of this rejoinder, while the corrected yearly discharges of Cauvery and Vennar (June to January) following the Assessor's curve are stated in column 7. From the corrected figures, it will be seen that the quantities at the Cauvery Dam which would have been realised under Mysore proposed rules, column 5, are, in every year but two, less, and in most years much less, than the quantity passed into the Cauvery and Vennar.

It is further to be pointed out that it is necessary to make a deduction from the discharges of the Cauvery Dam for losses in transmission and draw-off.

There are 6,700 acres of irrigation between the regulators and the Cauvery Dam while the losses by percolation, chiefly into the Coleroon, are very considerable. These losses are held by Mysore to be so great, as to be the principal source of supply of the Lower Coleroon system and that they constitute an adequate supply for the whole area under that system. While Madras absolutely deny this they do not deny that the losses into the Coleroon by leakage and seepage are considerable and this must be considered in comparing the discharges at the Cauvery Dam with the discharges past Cauvery and Vennar regulators.

73. The figures of Sir J. Benton of total discharges into Cauvery and Vennar have now been replaced by those in column 7, Appendix XXIV.

Reference-Mysore paragraph, 59.

The Mysore contention is that the whole of this quantity is not used for irrigation but that some of it is surplused without use, and that to such extent the quantity passed into the delta is excessive. There is no measure of the total quantity of water passed into the sea, and even if there was, it would not greatly help as the rainfall in the strip of 10 or 15 miles width, along the coast, is in the north-east monsoon specially heavy and of a torrential and cyclonic character, inducing sudden and heavy local floods. Putting aside rainfall, it is probable that in a good year considerable quantities of water after passing over the fields pass through drains into the sea, while in a bad year, there is also necessarily some but much diminished drainage so passed. It is to be realised that it is necessary for efficient rice cultivation to keep the water on the fields changing, and a free change of water is very beneficial to cultivation while stagnation of water connotes a bad crop. Drainage is thus an absolute necessity to rice cultivation and in the case of this deltaic tract spreading out like an open fan from an apex at Cauvery-Vennar regulators, to a great expanse along the coast on all of which expanse the water must be kept changing, the passing of considerable quantities of drainage water into the sea is a necessary corollary of successful cultivation. The remark in the triennial report of 1901-1902 does not suggest that all the water passed into the sea was wasted but suggests that some of it was in excess of requirements.

During the period to which this refers, the "falling shutter" regulation rules at the Upper Anicut were in force which enjoined passing up to 7½ feet into the Cauvery and it is admitted that excesses over about 6½ feet were passed to suit the conditions of these shutters, and that water over this limit passed into the Cauvery was frequently not necessary for irrigation.

This was altered from 1902 when the rules of that year specifying a 6·2 gauge limit were introduced.

Thus, the remark in the triennial report is as a fact quite justified.

For instance, the quantity of water passed into the delta in 1900-1901 was certainly more than was required for irrigation, and to a minor extent this also applies to 1901-1902.

In the light of this consideration, the remark is prefectly correct, and it in no way implies that passing water from a delta into the sea is necessarily an indication of non-user; this is indeed a necessity of delta irrigation and the only way of changing the water on the irrigated tracts along the coast.

74. It is denied that the measure of the inaccuracy of Sir J. Benton's figures is only the measure of difference between total supply and supply utilised. The inaccuracy of Sir J. Benton's figures and the reasons for this inaccuracy have been clearly explained.

Reference-Mysore paragraph 60.

75. The totals of Mysore table, Appendix G.-I, are reproduced in column 10, Appendix XXIV, and may be compared with the totals given in column 5 which shows the totals at the Cauvery Dam due to Mysore rules. From the totals in column 5 according to Mysore contentions most of the water required for the supply of the Lower Coleroon Anicut system must be deducted, as also ordinary loss by percolation, and draw-off for 6,000 acres.

Reference-Mysore paragraph 61.

Comparing the quantities however without deduction, it will be seen that the quantities given under Mysore rules, column 5, are less than the quantities at Cauvery-Vennar regulators, column 9, in nine years out of twenty. The figures in column 9 show the figures advanced by Mysore as the quantity to which under the rules of 1888-1892 Madras have a right at these regulators.

Madras have strongly combated this latter contention and shown that the rules do not justify such an interpretation, but even assuming it to be correct, the Mysore figures clearly show that the Mysore proposed limits at the Cauvery Dam are quite inadequate to supply even the Cauvery delta, neglecting the Coleroon

system altogether as well as draw off and ordinary transmission losses between the Cauvery Dam and the Grand Anicut.

The Mysore contention in paragraph 61 is an absolute admission that their proposed limit at the Cauvery Dam does not fully protect Madras even as regards the Cauvery Delta system but that it does so *in many cases and in others nearly* does so—*vide* the last clause in paragraph 61.

Reference-Mysore paragraph 62.

76. In this paragraph the local conditions of supply, the fluctuating character of the same, the wide and winding nature of the rivers and channels, and the porous nature of the subsoil in the Cauvery delta are all ignored, and rainfall is the only local condition considered.

It is advanced that 72 inches delivered on the fields is sufficient to raise a rice crop. The figure is not unreasonable on the assumption that this is delivered on the fields as assumed by Mysore and that the incidence of delivery is in accordance with requirements and fully controlled.

No allowance is made for loss in transmission between the head and the field in main canals, distributaries and water-courses.

The loss in such distribution even in well-designed modern systems is very great and varies from 40 to 75 per cent. of the whole supply.

Further, the area irrigated, 890,000 acres, considered, excludes consideration of the double cropped area, 90,000 odd acres. On this basis and taking the loss between the head and the fields as 40 per cent only, the water required is $(3\frac{1}{2} \times 980{,}000 \times 43{,}560) \times \frac{100}{60}$ c. ft. = 217,000 m. c. ft.

If such a supply were delivered at the Cauvery Dam in the form of a steady and well-controlled supply, it would suffice.

The allowance *exclusive of rainfall* made in the Metur Project was—

	Inches.
For double crop to raise two crops	66·05
For single crop land	49·45

This was *head duty at the Cauvery Dam* and not allowance *delivered on the field* and totals to 190,000 m. c. ft. yearly as a steady and fully controlled supply.

Compare this with the Mysore allowance of 42 inches on the fields and making no allowance for double crop land or for the fluctuating and uncertain incidence of flow, and it will be realised that even on purely theoretical considerations the supplies suggested by Mysore as denoting the limits of useful supply to Cauvery and Vennar are altogether inadequate.

Comparison of these total theoretical quantities with the figures given in Appendix XXIV, column 8, which shows the supply advanced by Madras as roughly representing *useful supply* to Cauvery and Vennar from 1902 to 1904 and column 7 which shows the useful supplies of the later years and it will be seen that these totals are reasonable having in view the fluctuating and uncertain nature of supplies.

Reference-Mysore paragraph 64.

77. The figures given by Sir J. Benton have been shown to be altogether wrong. The figures given by Mysore in paragraph 63 have also been shown to be calculated on a wrong basis and to be very much less than actually allowed by Madras in their Metur Project involving steady and assured supplies. The arguments here given by Mysore are based on altogether faulty figures and cannot be sustained.

The last clause is an admission by Mysore that the proposals put forward are knowingly such as will not fully safeguard Madras.

Reference-Mysore paragraph 65.

78. It is noted that Mysore repudiate any intention to advance that the standard of supply of a bad year should be applied in fixing the requirements of Madras.

Reference-Mysore paragraph 66.

79. It is in their arguments regarding the interpretation of the rules of regulation of 1882 at the Upper Anicut that Mysore have admitted that the limit to which Madras is entitled is a six feet gauge-reading on the Cauvery Dam.

Madras did not advance that the figures in the Table Appendix G involved an admission of this.

Reference-Mysore paragraph 67.

80. It is here admitted by Mysore that on her own figures and contentions Madras interests are not fully safeguarded.

Reference-Mysore paragraph 68.

81. The Madras claim and the terms of reference both confine the second issue to what is the flow which will preserve unimpaired the prescriptive rights of Madras.

The question is not what will adequately preserve Madras interests but what will fully preserve unimpaired Madras existing rights.

It is only by *mere flow* that Madras rights can be preserved and it is to natural flow within certain limits to which Madras lay claim.

Reference-Mysore paragraph 69.

82. Madras advance that allowances for rainfall worked out from the incidence of observed daily fall cannot be made on a basis of fixed rules. The basis of the rules advanced by Mysore is unsound for the reasons already stated.

The working will be still more impossible and the basis still more unsound now that it is advanced by Mysore that the period of transmission of flow from Kannambadi to the Cauvery Dam has been under-estimated.

The incidence of useful rainfall is wrongly computed in Mysore rules.

The actual application of the rules, even if drawn on an admittedly sound basis, would be impossibly complicated and would entail the consideration of the incidence and effect of the various rainfalls registered at different stations in the huge irrigated tract, on the numerous blocks receiving varying quantities of rain. The upper areas which are the most difficult to command are the blocks which receive normally the least rain and it is quite common for the coast areas to be flooded and submerged while the upper crops are perishing from want of water.

It is only under exceptional conditions of widely distributed rain that restriction of supply for rainfall would be safe and Madras cannot agree to the rules formulated by Mysore which are neither on a sound basis nor practically workable.

Lower Coleroon Anicut System.

Reference-Mysore paragraph 70.

83. The flow which under existing conditions is useful for supply of the Lower Coleroon system at any time when the Veeranam tank is not full is the whole natural flow of the river including all floods and this is the only limit, under such conditions, of the strict legal right of Madras.

The Madras Government have recognized that such a method of user entails on Mysore unduly onerous conditions and have restricted their claim to the flow in the Agunda Cauvery at the Upper Anicut which, under the conditions which obtained prior to remodelling, was required to give a flow of 7 feet over the Cauvery Dam. To this they claim to have prescriptive right and the proofs of the claim have been adduced.

The question of how the water to which Madras are adjudged to have right will be used in the future does not arise. The contention of the Mysore Durbar as regards Coleroon supplies is that all necessary supplies are obtained by leakage, seepage and involuntary surplus from the water passed over the Cauvery Dam primarily for the supply of the Cauvery Delta system.

Under such a contention, it is hard to understand how the other contention that the flow of the Agunda Cauvery should be separated into two distinct parts and separate allocation of water required for each branch of the river below the Upper Anicut.

The 644 million cubic feet which is included in the Madras limit flow claim over and above what under existing conditions will produce a flow of 7 feet over the Cauvery Dam will be utilized *when it is available* in giving supply to the Coleroon system and in giving occasional additional water to the Cauvery and Vennar.

84. Under existing conditions, when all the natural flow of the Cauvery which is not passed through the Cauvery and Vennar regulators flows through the Coleroon, the supplies to that system are sufficient. The existing conditions are altogether different from those which will obtain if the Mysore reservoir is built, and it is only by leaving water sufficient to allow of the passing of specific supplies into the Coleroon over and above what is required for the Cauvery delta that this system can be given adequate protection.

Reference-Mysore paragraph 71.

It is denied that Madras have in any way changed their position and the fact that their prescriptive right to all the limit flow asked can be maintained under considerations affecting only the Cauvery delta surely is strengthened by the fact that the supply of the Coleroon system for which water is undoubtedly required is proposed to be furnished within the same limit flow.

85. The actual method of arriving at the figure 644 million cubic feet has been fully and clearly explained and the figures have never been questioned. There has been no alteration. The claim to additional occasional supplies for the Cauvery system was made in the Madras original claim (Ma. 1, para. II-C) and reference to the record of actual discharges will show that such occasional additional supplies have passed over the Cauvery Dam and into the Cauvery and Vennar for as long as there are records.

Reference-Mysore paragraph 72.

The proof of necessity is only clear after the means of efficient control and exclusion were available and it is therefore especially to the gauge reading after 1902 that attention is drawn to prove the passing of occasional additional supply in excess of 7 feet which could have been diverted into the Coleroon at the Upper Anicut but were intentionally passed over the Cauvery Dam and into the Cauvery and Vennar. An examination of the daily registers shows that during this period such supplies were frequently deliberately passed, especially between 15th July and 15th September. It is on actual enjoyment as revealed by the water registers that the original claim to extra occasional supply was based and it was only withdrawn in the revised claim because it is covered by the 644 million cubic feet.

86. The Madras Government have made a claim to a limit flow in the Agunda Cauvery at the Upper Anicut which is intended to safeguard and supply all irrigation both above and below the Upper Anicut. The claim is based on a consideration of the requirements of the whole of the river systems of irrigation.

Reference-Mysore paragraph 73.

87. The Coleroon system is supplied—

Reference-Mysore paragraph 74.

(1) by water passed through the Upper and Grand Anicuts and over the 150 yards calingulah including floods;

(2) by percolation and leakage and drainage;

(3) by run-off of rainfall from the intercepted catchment area.

Seepage from the river bed and margins whereby a river continues to flow for weeks after any surface drainage runs into it is the chief source of the continuous flow of the Coleroon. A fresh converts the river bed into a reservoir which gradually gives out its store. The cutting off of much flood water and in a bad year of most flood water cannot but greatly affect Coleroon supplies on days when no flow is being passed through the surplus works. The proposed Mysore reservoir will have this effect.

The cutting off of floods will also directly and greatly diminish the supplies of the Veeranam tank which takes into it a percentage from all floods as already explained.

The whole conditions of supply of the Coleroon will be materially altered by the Mysore project and under such conditions specific supplies must be allowed to replace the supplies cut off through the interference with the natural flow now enjoyed.

The specific supply is not claimed for every day but only when there is a natural flow of more than 7 feet (2,300 million cubic feet) in the Agunda Cauvery at the Upper Anicut.

The Mysore contention that because the flow claimed is only seldom realised in certain years is not a reason for reducing but for increasing the flow required when it does come.

If 7 feet or even 6½ feet were constant flow nothing more would be required.

88. The Metur project is only a project still unsanctioned and the peculiar conditions of the Lower Coleroon irrigation and of the Vadavar supply were not known to Colonel Ellis when he drew it up. The water to be impounded by Madras under this project which was to be withdrawn from the Cauvery flow was to be impounded in the interests of, and at the call of, the area affected and therefore deficient supply could be rectified by issues from the reservoir.

Reference-Mysore paragraphs 75 and 76.

The conditions of the Lower Coleroon system, including the Vadavar and the Veeranam tank, have been studied and explained in detail in the descriptive portions of this case and it will be clear from these that they have been dealt with in an inadequate manner in the Metur project.

89. What is here put forward is that seepage and leakage alone is sufficient to supply the Coleroon irrigation.

Reference-Mysore, paragraph 77.

This irrigation is about 111,000 acres of which 63,000 acres come under the Vadavar and Veeranam tank, the area directly under the Vadavar and which is not supplied through the tank. The area is about 11,000 acres requiring a flow of about 20 m.c.ft. per day.

For the direct irrigation of the whole area under the Vadavar including the tank area, a flow of approximately 90 m.c.ft. per day is required so that the flow required through the Vadavar which will irrigate the whole ayacut without drawing on the tank impounded supplies is 110 m.c.ft. per day.

The tank capacity is sufficient to supply the 52,000 acres under it for 11 days from a full tank.

The supply of the Lower Anicut system—112,000 acres—requires a daily flow of about 194 m.c.ft. per day.

Referring to Mysore Appendix K and K-1, column 12, it will be seen that this column refers to the necessities of the direct irrigation under the Vadavar exclusive of Veeranam tank ayacut, that is, it does not provide the quantity required for direct irrigation of the whole area under the Vadavar—63,000 acres, but only for the 11,000 acres above Veeranam tank. When the quantities in column 11 of Appendix K-1 amount to 20 million cubic feet, the supplies passed are sufficient for the direct irrigation only of the area—11,000 acres. When the supplies in column 11 amount to 100 million cubic feet, the flow is sufficient for the direct irrigation of the whole area under this channel of supply—63,000 acres—without any assistance from the catchment or impounded store of water in Veeranam tank.

Mysore states that examination of the tables (K-1) will show that the "flow of the Lower Anicut canals have been maintained," meaning presumably that the supplies required for full direct supply have been maintained, throughout the whole period without any specific flow except on rare occasions from the Upper Anicut or Grand Anicut or 150 yards calingulah.

The suggestion is that unpreventable leakage and seepage fully supply the requirements. Scrutiny of the tables shows, however, that precisely the opposite is the case, and that a few days after direct supply from the above surplus works (column 6) has ceased, the supplies of the Vadavar (column 11) generally dwindle to below what is required for the 11,000 acres leaving the whole ayacut under Veeranam tank dependent on the already impounded supply.

It will further be seen by scrutiny that the *rare periods* in which supplies are received from the surplus works above (column 6) except in June and after 1st November amount to 175 days, out of a total of 379 days, or nearly half the period. The claim that adequate supplies were passed during periods when for any considerable number of successive days no water was passed over surplus works into the Coleroon is negatived by the tables.

The contention of Mysore that the supplies at the Lower Anicut have been well maintained when there were no specific recorded flow for long periods into the Coleroon is disproved by the tables.

For instance, take 1899. In July there was no specific discharge (column 6) from the 20th July to 14th August. During this period the discharge of the Vadavar was utterly insufficient even for the 11,000 acres direct irrigation under it for every single day from the 23rd July to the 15th August, while the discharge was "*nil*" for 21 days out of the 25. There was a small discharge of water from the surplus works into the Coleroon on 15th and 16th August and to this the Vadavar responded and gave just enough supply for its direct ayacut (excluding Veeranam tank) for 2 days, and after that the supplies again dwindled to materially below what was required for the direct ayacut.

The table put in by Mysore shows that the supplies in the Vadavar dwindle and become quite inadequate as soon as the figures in column 6 are *nil* for any considerable number of successive days. In the latter part of the year, this is not so marked because the receipts from the catchment of the river below the Upper Anicut are in the north-east monsoon considerable.

In 1905, exactly the same thing is observable from the 9th to 28th August and from 16th to 30th September.

In 1906, owing to no discharge passing the surplus works, supplies of the Vadavar are very inadequate for the last week of September and the first week of October.

The figures in the tables, columns 6 and 11, do not support the Mysore arguments but on the contrary show that after a few days the effect of closing all direct supply from the Cauvery is a marked diminution of the supplies passed into the Vadavar and a very inadequate flow in that channel.

It is claimed that columns 6 and 11 of table K-1 show precisely the reverse of what is claimed for the table in Mysore paragraph 77.

20. The suggestion of Mysore here made is that the Madras discharges of the Lower Anicut were advanced by the Madras Government as accurate. This is altogether the reverse of the fact. The discharges were called for by Mysore and in handing them over at Ootacamund at a meeting of the Arbitration Committee, the Madras Representative stated that these discharges were produced as they stood from Madras records, but that the figures were unreliable and only the discharges at the Cauvery Dam and at Bhavani bridge were advanced by Madras as reliable.

Reference-Mysore, paragraph 78.

The daily tables K-1 have been examined and it is found that they omit a very material item from consideration under heading column 8 which should be the algebraic sum (column 7—column 6). The omission is the *minus* figures. Thus, when there is a gain in discharge at the Lower Anicut over the corresponding recorded total discharges of the Upper Anicut, 150 yards calingulah and Grand Anicut, the amount of such gain is recorded. When, however, as very frequently happens, a loss in transmission takes place, this has not been considered. It has been explained above that a very material item in sustaining the flow of the Coleroon is the seepage from the river-bed itself impounded during periods of considerable flow, and given out when the surplus works above are shut down, and having this in view the omission to include the record of loss vitiates the whole of Mysore table Appendix K-1 and the abstract of this, Appendix K of Part II, of My. 7.

A revised set of abstracts showing the figures which ought to appear in the Mysore Appendix K has been drawn up (Appendix XXV). In drawing up these abstracts, the discharges over the 150 yards calingulah given by Mysore have been retained although the source from which these discharges have been obtained cannot be traced.

It will be seen from the revised tables that continuous half-monthly gains in transmission which are displayed in Mysore tables are not borne out by the recorded discharges and frequent, great and unexplained losses are recorded.

The column 8 (*c*) of Appendix XXV shows the net half-monthly result. It is only to be expected that there will be considerable unaccounted for gains in transmission in the Coleroon after rainfall in the catchment, or when a low stage succeeds a considerable fresh, and indeed in all periods of very low stage of flow.

Madras do not attempt to argue on the figures in the revised column 8 and admit that the discharges of the Lower Anicut are unreliable but put it on record that the Mysore table omits very material items, and that the net total of column 8 should be (column 7—column 6) and should show *minus* as well as *plus* results.

Under this explanation, it will be clear that the figures in paragraph 78 are erroneous and misleading as they ought to be the algebraic total of (column 7—column 6).

The figures in the columns of the table below are from Appendix XXV and from Appendix K, My.-7, and show the differences resulting—

	Year	Total column 7, Appendix K	Total column 6, Appendix K	Difference, column 7 *minus* column 6	Mysore figures, column 8, Appendix K
June to January	1899—00	62,018	52,335	9,683	20,594
	1904—05	189,980	131,100	55,880	63,634
	1905—06	150,777	105,103	45,674	54,439
	1906—07	251,074	175,295	75,779	103,112
June to September	1899—00	52,808	52,335	473	11,384
	1904—05	177,690	131,326	46,364	54,103
	1905—06	83,788	65,572	18,216	27,615
	1906—07	150,004	135,861	14,143	38,156

It will be seen that the figures quoted by Mysore are misleading.

Further, the figures quoted include all inflow from rainfall into the Coleroon from its catchment of 1,077 square miles. This is after heavy rainfall very considerable and this is frequent in the north-east monsoon. Last November (1913) a big flood passed over the Lower Anicut when both Upper and Grand Anicuts were closed.

The statement of Mysore that extra flow in the Coleroon (column 7) can only be derived from leakage is quite wrong in fact. Inflow from rainfall, and seepage from the stores left in the river-bed by freshes, are both fruitful sources of supply—the former, especially from October, and the latter especially in the earlier months of the year.

Reference is invited to the figures tabulated above separately for the south-west monsoon.

It is in the south-west monsoon that the Lower Anicut system is almost altogether dependent on Cauvery water, and the freshes of this period both during, and after, actual incidence of flow in this river, are a very valuable source of supply which will be materially impaired should the Mysore project be carried out.

It is claimed to have been shown that the conclusions of Mysore are based on inaccurate figures, inaccurately put forward, and that the figures themselves do not support Mysore contentions.

Reference-Mysore, paragraph 79.

91. The suggestion made that seepage in the Coleroon will not be affected by the reduction of supplies passing in the Cauvery and of the freshes and floods in the Coleroon is utterly untenable. Leakage and seepage from the Cauvery vary in amount with the height of flow and quantity of water passing down it.

Seepage from the Coleroon bed is dependent on the incidence and height of freshes passed down the Coleroon. Reduction in the quantity passed down the Cauvery, or into the freshes passed in the Coleroon must reduce the resultant leakage and seepage. This is not a matter open to doubt. Even therefore if the Mysore contentions that seepage can supply all requirements under present conditions were true, which is denied, it would not at all follow that under the reduced flow occasioned by the new conditions the proposition would still hold.

Reference-Mysore, paragraph 80.

92. The study of the tables K, do not tend to confirm the Mysore contentions.

93. In the Madras, Part II, paragraph 38 (Ma. 8), it is stated that Veeranam tank does not begin to impound till there is a flow at the Lower Anicut of 25,674 cusecs. The expression "begins to impound" there used, had reference to conditions in which the inflow from the Vadavar into Veeranam tank included the daily draw-off from the tank for supply of irrigation under it. That is, that unless inflow exceeded drawing off, there was no impounding.

Reference-Mysore, paragraph 81.

The argument used by Mysore is that when the supply is less than what is required for impounding, such supply is useless, is so patently untenable that it only requires to be stated, to be dismissed.

Further, Mysore has taken the figures *relating to the conditions of the Lower Anicut before remodelling*. Such a condition involves the necessity for much more water than is claimed, as Madras are not claiming their full legal rights as regards the Lower Anicut.

94. There is no reason to suppose that at the time of remodelling of the Upper Anicut there existed any new, or aggravated set of unfavourable conditions, but the power of control, and the undoubted superiority of the type of the new work proposed, as regards both flood discharge and supply, rendered remodelling very desirable. The trouble from sand accumulations was not new in 1898, but had been an ever-present trouble from the time of the construction of the Upper Anicut. The reconstruction of the Upper Anicut does not render scour unnecessary, but floods passed into the Coleroon act more efficiently in effecting scour than was the case with the old work.

Reference-Mysore, paragraph 82.

95. It is noted that Mysore admit that the volume of water passed by high floods has an important bearing and effect on the supplies to the Coleroon system. The Madras Government have, subject to the allowance of adequate specific provision for the Coleroon system, to replace the losses by impounding in Mysore reservoir, waived their right to such floods, but note that the importance of floods in the Coleroon in their effect on the Lower Anicut system supplies, which they have all along urged are now recognized by Mysore.

Reference-Mysore, paragraph 84.

96. It is denied that seepage alone can adequately supply the Coleroon system under existing conditions of natural flood and flow; but, even if this were the case, it cannot be contended that the amount of flow due to seepage will not be materially reduced by reducing the number and quantity of freshes passing down the Coleroon, and reducing the supplies passing down the Cauvery.

Reference-Mysore, paragraph 85.

Seepage and leakage from the Cauvery to the Coleroon increase and diminish with water levels in the Cauvery and the reduction of such levels connotes reduction of seepage.

Reduction of supplies to the fields connotes reduction of surface drainage from these.

Under existing conditions occasional freshes are an essential to adequate supply and seepage alone is quite inadequate. How much more inadequate would it be under proposed conditions?

97. The consideration of the second remodelling of the Lower Anicut by cutting down the crest 2 feet while retaining the height of the top shutters when resting on the crest unaltered does not enter into this case. The work was, it is found, not actually carried out till the year 1910 and the conditions prior to November 1909 are what limits the present case. The difference of conditions even if it required consideration has a very small effect on the matter at issue. The inferences drawn by Mysore are denied.

Reference-Mysore, paragraph 86.

98. In a good year, the effect of the Mysore reservoir on the incidence of floods will not be such as to seriously injure Madras, but this is not so in a bad year. In such a year the cutting off of flood water by Mysore would, without compensation in the form of specific supply, greatly affect the supplies at the Lower Anicut due to both direct impounding from floods and seepage due to past floods.

Reference-Mysore, paragraph 87.

99. The Government of Madras protest most strongly against the misrepresentation conveyed in this paragraph. Madras paragraph 99, Part VI (Madras 12), specifies "the whole natural flow of the river", but this is wrongly represented by Mysore as the "average estimated natural flow."

Reference-Mysore, paragraph 88.

This reference arose from My. 7, Part II, paragraph 78, and the words "Even if the waiver is now withdrawn, they are entitled to the natural flow of the river after the customary Mysore requirements are satisfied."

When this was read, the Madras Representative asked if this was an admission that Madras was entitled to such natural flow; on this being assented to by the Mysore representative, it was asked that this should be stated in writing.

Both the Arbitrator and the Assessor thereupon expressed the opinion that the statement was a clear admission of the Madras right, and the Mysore Representative said that, as the right was already admitted in writing under the signature of the Secretary to Government, Mysore, he could not see why any further demand was made.

The Madras Representative in view of the opinions expressed then withdrew his request. The Madras Government claim that they are entitled to hold the Mysore Durbar to the admission made.

The compromise to which the Madras Government are prepared to agree so as to facilitate the working of the Mysore project in the hot weather is stated in Part VI, paragraph 99 (Madras 12).

Madras-Cauvery channels above the Upper-Anicut.

100. It is not immediately apparent how the limit flow to be settled as required at the Upper Anicut to conserve unimpaired Madras rights will be affected by consideration of the conditions of irrigation of channels taking off many miles up river and quite outside the influence of the diversion works at this place and it is regretted that the conditions of irrigation of these upper channels have not previously been clearly put before the Arbitrator. The reason is that it is only recently that the full significance of these conditions has been recognised by the Madras representative.

101. At first sight it appears that, if sufficient limit flow at the Upper Anicut is allowed to fully protect the interests of irrigation below, the interests of irrigation above will be fully protected, as these channels, being situated higher up the river, will already have taken all the water they require before the flow reaches the Upper Anicut. This would be so if there were anicuts below the offtakes of these channels holding up water to the level of full supply at the head of each channel and thus enabling the required water to be drawn off by the higher channel before any is passed down.

There are, however, no anicuts on the Cauvery between the confluence of the Bhavani and the Upper Anicut and the channels take off from the river without the supply being assisted by any diversion work.

102. Most of the channels have open heads but a few have head sluices. Their conditions of supply are different and must be considered separately for two seasons:—

(*a*) The season of freshes from the first fresh in June to December.

(*b*) The low river season—December to June.

In these channels irrigation goes on continuously throughout the year.

103. In the season of freshes the level of water entering at the head of the channels with open heads is the same level as the water level in the Cauvery at the place of offtake and thus the amount of water entering the channel varies with the stage of the main river. In order to prevent damage from quantities of water passed into the channels in excess of their requirements of carrying capacities, surplus works are provided. In channels where there are head sluices these are used for this purpose.

In this season therefore the supplies to these channels are fluctuating and the fluctuations depend on the natural fluctuations in incidence of level of water in the river that is on the stages of flow. The limit of useful supply is that stage of flow

which will cause as much water to enter a channel as the channel can carry or make use of. In this season a low river connotes a very deficient supply and a high river a good supply.

104. It will be clear that the prescriptive rights of Madras in this season for the purpose of supply of these channels embraces all natural flow up to a stage of river flow giving maximum useful supply to each channel. As it is settled that the limit flow of the Agunda Cauvery at the Upper Anicut shall be that fixed for defining the rights of Madras, the question is what is the quantity of flow of the Agunda Cauvery at the Upper Anicut which connotes the stage of river above, required to give maximum useful supply to the upper channels. Any reduction below this limit of the flow at the Upper Anicut must reduce the useful supply of these upper channels.

The stage of river flow which gives full useful supply to the channels between Bhavani and the Upper Anicut is about 2,300 to 2,800 million cubic feet in 24 hours or a stage between say 7 and 7½ feet at the Cauvery Dam. It is believed that stages of over 8 feet are not useful while stages of under 7 feet involve material reduction of useful supply throughout the season of freshes.

It is not possible to give an exact figure to connect the stage at the Upper Anicut with the stage at the different points of offtake all up the river and only an approximation can be furnished.

The limit of maximum useful supply to these upper channels is an even more important matter to these channels during the later part of the season of freshes than in July-August. Fairly liberal supplies are common in the earlier months, in the later months supplies are on most days quite inadequate and are only recouped by occasional freshes. Although rainfall increases as the season progresses, this increase is nothing like so great as it is the delta tracts and thus the channels require in proportion a greater average river supply in these months to keep the irrigation in good condition. The times of scarcity for these channels are from September to November when the ordinary river flow connotes a stage of river between 3½ and 5½ feet on the Cauvery Dam.

In the season of freshes up to December the seasonal incidence of flow of the river does not permit the construction of " korambus " which are universally employed in the low river season for this purpose from December to the first fresh in June.

105. In low river season "korambus," which are long brushwood spurs, are run out from the heads of the channels up stream into the river and by this means sufficient flow is held up and diverted into the channel head to supply the irrigated area. These " korambus " are maintained throughout the hot weather until washed away by the first freshes of June. It is only by these means that the flow of the river can be diverted into the channels with a low river.

Limit flow required at the Upper Anicut.

106. In considering what is the limit flow in the Agunda Cauvery at the Upper Anicut required, it is necessary to consider the requirements of the whole system of irrigation considered together and not as has been suggested by Mysore to estimate separately the requirements of each.

For the upper channels the limit stage of flow which will fully preserve the prescriptive rights of these channels is practically that which is claimed as necessary for the preservation of the rights of Madras below the Upper Anicut and it is to be recognised that disturbance of the natural flow below these limits would reduce the customary useful supplies of these channels even if there were no system of irrigation below also calling for its full customary useful supply.

PART X—FACTS AND ENGINEERING ARGUMENTS.

REJOINDER OF MADRAS TO MYSORE REPLY, PART III (MY. 9)—THIRD ISSUE.

107. With reference to Appendix X (Ma. 10), it is contended by Mysore that it is impossible that the figures of discharges shown can be accurate on the grounds stated. The discharges of the Cauvery Dam are liable to fluctuations of as much as 10

Reference-Mysore, paragraph 91.

per cent from the normal curve in accordance with the incidence of previous flow, and the flow after a prolonged period of low river is reduced, while the reverse is the case after a prolonged stage of good fresh. On this occasion, the river had been continuously below normal for a considerable time and in consequence the quantities at the Cauvery Dam may have been less than the normal discharges due to gauge readings by anything up to 10 per cent. It is not claimed that this is so, but there is a reasonable probability of this. Ten per cent of 195,046 would be 19,504 and this is a consideration which should not be overlooked.

Again, it is urged by Mysore that no inflow was received from the Bhavani during the period. This is incorrect and the records show a flow during this period which, by adding together the average daily discharge in cusecs, totals to 9,854, not counting leakages through the great length of anicut and percolation or surplus from the Kalingaroyan channel and the irrigation under it which extends for 30 miles in a narrow strip along the right margin of the Cauvery.

Again, no consideration has been paid to the rainfall falling on the catchment below the Bhavani and above the Upper Anicut in the period referred to.

There was fairly heavy rain in the catchment draining into the Cauvery left side below the Amaravati confluence.

In the second half of August, there were 2 inches of rain in this catchment, while between the 1st and 18th September there were another 2 inches.

As regards the direct irrigation between Bhavani and the Upper Anicut, channels having heads independent of any anicut only receive small supplies with the river in the stage of flow representative of this period (5·4 to 3·4 on the Cauvery Dam). These channels only receive adequate supplies with a stage of river flow of 6 feet and upwards on the Cauvery Dam unless at a time of year permitting the erection of "korambus" which enable water to be diverted into the channel heads.

If the above points are taken into consideration, the matter assumes a different aspect from that in which it is represented in Mysore, paragraph 91.

Reference-Mysore, paragraph 92.

108. Even if the arguments and conclusions of Mysore paragraph 91 were admitted, they do not support the inference made in paragraph 92.

Reference-Mysore, paragraph 94.

109. The Madras computations are based on the only available recorded discharges. They are not based on either the allowances of the Metur Project or those made by Mr. McHutchin.

Reference-Mysore, paragraphs 95 and 66.

110. It is not clear what useful purpose will be served by the proposed observations below the confluence of the Bhavani and Amaravati (rule 8, Mysore Appendix E). The observations are unlikely to materially assist in fixing the time of transmission.

There appears, however, to be no objection to taking these except the expense and labour and the multiplication of gauging stations involved.

Reference-Mysore, paragraph 99.

111. It has been settled that all papers should be shown to the Assessor regarding the extension of irrigation above Kannambadi and regarding compensation to and resettling of the ryots disturbed by submergence in the Mysore reservoir water-spread area.

Reference-Mysore, paragraphs 100 and 102.

112. A reference to paragraph 32 of Sir J. Benton's note shows the conclusions arrived at which involve the method of measurement in Mysore of limit flow, and in the explanatory final remark sub-paragraph (v) he says; ".....as will be seen from sub-paragraphs (i) and (ii) above in which I have endeavoured to clearly explain that the Mysore Durbar are to have all the surplus supplies to which they have any claim under the existing Agreement placed unconditionally at their disposal." It was under acceptance of conditions (i) and (ii) that the balance was to be unconditionally at the disposal of Mysore. These conditions are based on a system of measurement in Mysore and only in Mysore, and Madras most strongly hold that a system of measurement in Madras must entail complications, friction and interference with all future development in Madras which must produce intolerable conditions.

The existing rights of Madras include rights of improvement and development of irrigation resources and the Madras Government claim that these rights shall be preserved to them.

The concession to Mysore of any right of future interference with the development of irrigation resources in Madras would undoubtedly impair the existing right to development at will in all the country below the Mysore boundary and the Madras Government claim this as one of their existing important rights which must be preserved unimpaired.

It is strictly on the basis of the Agreement of 1892 and the preservation of existing rights of Madras unimpaired that this Government claim that this matter shall be decided.

A system of measurement at the Upper Anicut concedes to Mysore rights in the flow of the Bhavani, the Amaravati and all the basin of the Cauvery to which she has no title whatever, and in just so much as it does this it impairs the existing rights of Madras in these streams and imposes on Madras a burden never before existing and thus takes away from the existing rights.

113. The object of Mysore is to get as much water for impounding as possible. The object of Madras is to safeguard her existing rights both as regards incidence of flow and limit quantity of useful flow and existing rights to development. It is the Madras contention that their existing rights must be fully provided for and only under methods by which this is fully provided for will any mode of impounding be satisfactory.

Reference-Mysore, paragraphs 103 and 104.

114. The figures of Mysore tables, revised for a time of transmission of four days in place of three days, still show that the rules constitute a material interference with and restriction on the rights of Madras which Mysore have advanced as being the proper ones.

Reference-Mysore, paragraphs 105, 106, 107 and 108.

The interference is material as regards—

(*a*) quantity of useful flow which is materially less than the rules allow;

(*b*) incidence of flow which is materially more fluctuating than the natural flow within the useful limits.

Other objections are stated in later paragraphs.

115. In the table given in Mysore paragraph 109, it is submitted that column 3 is an admission of deficiency of supply.

Reference-Mysore, paragraph 109.

It is claimed that the quantities in column 4 constitute a "set off" against this. This is an altogether illogical and untenable claim.

The hypothesis on which the tables are drawn and Mysore rules framed is that the limit flow allowed in the rules (which are the limits on which the tables are drawn) is the *maximum useful flow* and will fully preserve Madras rights unimpaired.

If this is admitted, excess over this cannot be *useful flow*. If it is not admitted, the basis of the rules on which the tables are drawn is faulty and no argument or deduction can be made from them.

It is not open to take Mysore limits for drawing the tables and argue that, every day on which the flow is not reduced by impounding below this, Madras interests are fully conserved and also to argue that, on days on which the flow is in excess of this, this flow or any part of it is "useful surplus." Under the hypothesis of the rules, the figures in column 7 are useless surplus and the table is an admission of the Madras contention.

Madras state that the Mysore limits are not the full useful limit and in the original tables drawn by them have named the limit which they claim, and drawn their tables for that limit treating all excess over it as useless and all flow below as "useful."

If Mysore admit the higher flow to be useful, they must alter their rules and the basis of their tables.

Reference-Mysore, paragraph 110.

116. As regards "useful surplus," the arguments in the last paragraph need not be repeated.

The Madras case did not state that the quantity of deficient water would entail a reduction of area cultivated, but stated what area could be cultivated with the quantity of water of which, by hypothesis, they were wrongfully deprived; this was stated with a view of formulating in general terms what such a reduction amounted to. What would actually happen in such a case would be:—

(*a*) In a good year the average outturn of crop per acre would be reduced.

(*b*) In a bad year, the reduction would entail probable failure more or less complete to an area several times larger than that stated as the area equivalent to the deficiency.

The suggestion that water in excess of what is the *maximum useful limit supply* could be used to extend cultivation under existing conditions is obviously untenable.

Reference-Mysore, paragraph 111.

117. The incidence of natural flow is fluctuating and the diagram of flow serrated. This is by all admitted to be an unfavourable condition for irrigation. Any system which makes the natural flow still more fluctuating and the diagram still more serrated imposes more unfavourable conditions on irrigation and must undoubtedly impair Madras existing rights to the natural incidence of flow within useful limits.

Reference-Mysore, paragraph 112.

118. The argument here is that the infringement of Madras rights is "only a very little one." Madras do not admit this but claim that Mysore have admitted that the Madras rights are not maintained unimpaired.

Reference-Mysore, paragraphs 113 and 114.

119. These again are admissions of interference but a pleading that it is insignificant.

Five per cent on one million acres is 50,000 acres and one per cent is 10,000 acres.

Surely, this is in no way negligible or insignificant. The loss to the landholders would be very heavy.

Reference-Mysore, paragraph 115.

120. The reference to tables based on the flow of part of a single season cannot be seriously taken as proof of absence of interference with rights.

It is only by applying the test of working tables to the flow of a long series of years that the effects of the changes and rules suggested can be estimated.

Reference-Mysore, paragraph 116.

121. Madras demand to be fully safeguarded in the worst year as well as in every year and the necessity is obviously greater in a bad year. It is denied that Madras have stated they have no intention of seeking full protection in the worst year.

Reference-Mysore. paragraph 117.

122. This is an admission that Mysore rules fail to fully protect Madras. Also see paragraph 119 above.

Reference-Mysore, paragraph 118.

123. The Madras claim is that the system and rules of impounding in Mysore reservoir must be such as will preserve unimpaired the existing prescriptive rights of Madras.

It is contended that no system involving measurement at the Upper Anicut and necessity of passing compensation water can fulfil such a requirement. In addition to the objections to the Mysore rules stated under headings (*a*) and (*b*), paragraph 114 *supra*, the system has the following inherent defects:—

(*c*) It entails rights to interference and restriction on expansion and development of irrigation in Madras which rights do not now exist. Madras claim that the right to non-interference and to development is an existing one.

(*d*) The system has the fatal defect that the measurements at the Upper Anicut cannot give a basis on which the natural flow can be computed.

124. All examination of the working of the Mysore system and the general effect of such a system can be stated in the form of tables for past years for which the natural flow at both Kannambadi and the Upper Anicut is already known. From this known natural flow the computation of amount of compensation water can be made.

If the natural flow were not known, reasonably accurate computation would be impossible.

This defect is one which has not been before stated and was not before clearly appreciated; but it appears to be one which is, apart from the other grave objections, fatal to a system of issue of compensation water on measurements of flow at the Upper Anicut. The defect above stated will be best illustrated by reference to working tables.

Reference is made to the printed tables, Appendix XIX (Ma. 13), in which the time of transmission is three days rather than to the Mysore tables (Appendix R., My. 9) which have not been printed and are therefore not convenient for reference. It is to be understood that this is only done for convenience of illustration and the argument referred to either table is the same.

In the tables, the figures column 7 and in column 5 "Net flow at Cauvery Dam" are obtained from computation from the already recorded natural flow (column 3).

These latter figures would not be available for working Mysore system in the future and the measurement to be taken would give the figures to be entered in column 7 from which column 5 figures could be computed.

These measurements will, however, result in higher comparative discharges than those now shown in column 5 whenever there is impounding.

As an illustration, it will be obvious that in cases where *minus* figures now appear in column 5 and column 7 that this could not be a result of actual measurement and further that even a *nil* flow could never be recorded.

There are two causes for this :—

(1) A rapidly falling inflow in a river bed at a low stage of flow results in a flow in the river in excess of the actual inflow; this is due to seepage from the bed and sides. Let this excess equal S.

(2) The reduction of incidence of natural water level in the Cauvery would result in all the channels between Bhavani and Upper Anicut, which do not take off from anicuts, getting materially less supply than they would under the incidence of natural flow. Let this reduction equal R.

The figures in column 5 (or column 7) obtained from actual measurement will be in excess of the figures giving true results by the quantity $(S+R)$ and as a result of computation of "natural flow" will be in excess by the same amount. There are no means of determining the actual values of the above excess from day to day but some idea of the quantities which may be involved can be formed by reference to the *minus* figures in column 5, Table III-A (Appendix XIX, Ma. 13). These *minus* figures cannot exceed the value of R for the corresponding date.

The amount of compensation water to be passed has to be computed from the measurement of actual flow at the Cauvery Dam and the above source of error which will be both indeterminate and of constant occurrence will be seen to be also material as regards quantity and the effect will be a reduction of supplies of compensation water due to Madras.

Further, even if the quantity due to R could be determined in every case and allowed for in compensation water, it would be very frequently impossible to pass this compensation water into those channels which had originally been deprived of this supply which are the channels taking off between Bhavani and the Cauvery Dam.

Again, the flow at the Cauvery Dam is not constant for the same gauge reading but varies as much as ten per cent on either side of the normal, being less after periods of continuous low river and *vice versa*. This would affect Madras adversely just at the times when water was most wanted. The adverse effect on Madras would be the greater, as the incidence of continuous absence of freshes would under the new conditions be longer and more frequent than under the existing ones.

125. The matter of the effect of stage of river flow on the supply of channels above the Upper Anicut has been considered separately in the arguments on the second issue and this has further an important bearing on the matter of altering the incidence of flow. A certain level is required to feed any water into each channel before the erection of "korambus."

The addition, to the river supply by way of compensation, of sufficient water to supply these channels would, by no means, secure the possibility of passing the water into the channels.

If the channels under the incidence of natural flow get a dificient supply, this is the act of God and there is no infringement of rights; if, however, the natural flow is disturbed and thereby the supply suffers, the rights of the ryots are certainly impaired and infringed.

126. To recapitulate, the Government of Madras object to the Mysore system and rules on the grounds—

(*a*) that it does not preserve their prescriptive rights unimpaired as regards quantity of flow;

(*b*) that it fails in a similar manner as regards incidence of flow;

(*c*) that it will impair existing rights to full control and development of works in the basin of the Cauvery below Mysore and above the Upper Anicut;

(*d*) that it is impossible under the system proposed to make any accurate measurement of the compensation water due to Madras.

Appendix XXI.

FIRST CROP.

Statement showing the area irrigated by the channels and tanks fed by the Cauvery and its tributaries above the Upper Anicut during the years 1880 to 1889 so far as records are forthcoming.

District	Taluk	River	Tributary or channel	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	Remarks
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
				ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	
Salem	Salem, Tiruchengode and Omalur.	Tirumanimuthar.	.....	2,323	2,415	2,343	2,471	2,289	2,319	3,160	3,150	2,741	2,878	Figures in respect of certain works fed by the Tirumanimuthar and Omalur rivers are not available.
		Omalur river or Sarabanganadi.	.....	1,745	1,645	1,855	1,876	1,461	1,848	1,764	2,087	1,863	2,036	
		Thoppiyar ...	.....	...	...	...	...	...	...	...	...	...	...	Figures are not available.
	Dharmapuri ...	Sanathkumaranadi.	.....	231	254	242	275	264	249	258	259	272	265	
Coimbatore	Gobichettipalayam, Bhavani and Erode.	Bhavani ...	Thadapalli and Arakankotai channels including Anantha-sagaram tank.	...	...	...	...	...	...	...	...	...	...	The records connected with these are reported to have been destroyed.
			Kalingarayan channel.	...	...	...	...	...	...	...	...	...	...	Information not available.
	Avanashi ...	...	Other channels ...	167	224	234	240	253	256	203	228	236	246	In the case of Coonoor and Kallar river channels information is not available.
	Avanashi, Coimbatore, Palladam, Dharapuram and Erode.	Noyel ...	.....	1,756	2,333	2,423	4,264	4,610	4,581	6,802	6,577	6,670	6,801	For some of the channels and tanks in Coimbatore and Erode taluks, accounts are not available for the years 1880 to 1889 inclusive.
Trichinopoly ...	Udamalpet and Dharapuram.	Amaravati ...	22 channels ...	(a) 1,514	10,193	10,217	10,170	10,217	10,255	10,202	9,888	9,916	10,032	(a) This represents the area in 1880 under some of the channels in Udamalpet taluk only. The other figures, *i.e.*, from 1881 to 1889, are the areas under the channels in Dharapuram taluk and under some of the channels in Udamalpet taluk and exclude the areas under the channels in Karur taluk.
	Karur ...													
	Kulittalai ...	Amaravati ...	4 channels ...	...	...	...	...	...	...	...	..	...	...	Information not available. The Collector of Trichinopoly has not given separate figures for the area under the Amaravati channels in Kulittalai taluk. A further reference to him has been made.

Appendix XXI—*contd*

First Crop—*contd.*

Statement showing the area irrigated by the channels and tanks fed by the Cauvery and its tributaries above the Upper Anicut during the years 1880 to 1889 so far as records are forthcoming—*contd.*

District	Taluk	River	Tributary or channel	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	Remarks
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Madura ...	Palni ...	Amaravati ...	Nanganjiyar ...	ACS. ...	ACS. ...	ACS. ...	ACS. ...	ACS. ...	ACS. ...	ACS. ..	ACS. ...	ACS. ...	ACS. ...	Figures are not available.
			Shunmuganadi ...	3,390	3,395	3,478	3,495	5,957	4,807	4,870	4,824	4,761	4,701	Areas under some of the works connected with the Shunmuganadi are not available for the years 1880 to 1883 and 1885 to 1889.
			Poranthalar ...	851	880	919	945	851	927	895	881	902	904	
			Pachiyar ...	...	...	...	...	1,540	...	...	...	...	...	Information is not available for the years 1880 to 1883 and 1885 to 1889.
			Nallathangayar ...	122	119	121	123	126	64	48	60	58	55	Figures are not available for some of the works.
			Varattar ...	1,716	1,409	1,690	1,701	1,945	1,673	1,312	1,669	1,481	1,531	The Collector of Madura reports that the area under the tanks and channels fed by the Varattar in Dindigul taluk is not available.
	Dindigal ...	...	Odai flowing into Varattar. Varattar flowing into Kodavanar. Santhanavardhani ... Odai flowing into Kodavanar. Odai flowing into Santhanavardhani. Kodavanar ... Sirumalai Odai flowing into Santhanavardhani. Sittar ... Karumalai Odai.	...	...	...	...	...	...	...	...	...	...	The Collector of Madura reports that the information for these works, which are in Dindigul taluk is not available.
Coimbatore ...	Udumalpet ...		Kuthirayar ...	...	...	...	...	...	...	..	...	...	...	The Collector of Coimbatore reports that the accounts of irrigation are not available.
Tirchinopoly ...	Karur ...	Cauvery	Pogalore channel ... Vangal do ... Nerur do ...	...	...	...	...	...	...	...	...	...	...	The Collector of Trichinopoly has reported that the area in Karur taluk is not available.

Appendix XXI– *concld.*

First Crop—*concld.*

Statement showing the area irrigated by the channels and tanks fed by the Cauvery and its tributaries above the Upper Anicut during the years 1880 to 1889 so far as records are forthcoming—*concld.*

District	Taluk	River	Tributary or channel	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	Remarks
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
				ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	
Trichinopoly—concld.	Kulittalai ...	...	Krishnarayapuram channel. Mahadanapuram channel. Marudur Nattu-voikal. Nangam voikal ...	7,881	8,375	8,856	8,656	8,729	8,849	8,865	8,880	8,930	9,069	The Collector of Trichinopoly has not furnished the information separately for the Cauvery and Amaravati irrigation in Kulittalai taluk. The average of the irrigation of the four Amaravati channels of later years (2,584 acres) has been deducted from the Collectors' total for the taluk and the balance is shown against this entry.
	Namakkal	...	Raja channel ... Mohanur channel ... Komarapalaiyam channel.	5,215	5,251	5,260	5,257	5,190	5,329	5,252	5,254	5,217	5,248	
	Musiri ...	...	Ayilur channel ... Siplaputhur channel Tottiyam Chinna channel. Tottiyam Periya channel. Srinivasanallur channel. Musiri Voikal (channel). Amur Voikal (channel). Konaselam channel ...	12,318	13,262	13,253	13,745	13,431	13,826	13,958	13,789	14,348	14,240	
	Trichinopoly ...	...	Uyyakondan channel Ramavoitalai channel Peruvalai channel ... Panguni channel ... Ayyan channel ...	57,005	57,643	57,694	58,080	57,590	56,534	58,711	58,706	58,547	60,839	

Appendix XXII.

Note regarding figures of "Average discharge at head" Appendix V, of Sir J. Benton's Note of 12th May 1911 (Exhibit Ma. 8-a.)

It is stated in Ma. 12, Part VI, paragraphs 61 to 65, that endeavour has been unsuccessfully made to trace the source of the figures in columns 3, 4, 5, 6 of this appendix and further that the basis on which average discharge was computed (columns 5 and 6) must have been different except for the years 1907-08, 1908-09 and 1909-10 from that on which the figures in columns 3 and 4 were computed.

2. Further enquiry has just disclosed the basis of figures in columns 5 and 6.

The discharges for the period referred to shown in columns 5 and 6 are found to be :—

For figures in column 5 the average recorded discharge of the Cauvery and Vennar for the months of June to November (183 days).

The figures in column 6 is the average recorded discharge of the Cauvery and Vennar for the months of December to March (121 days).

Thus the figure in column should be 183 days and in column 6 should be 121.

The figures were given correctly for a single year 1897-98.

The figures of 1899-00, 1905-06 and 1906-07 are an exception to the above, as the discharge diagrams for the last two years were finally prepared on the basis of Mr. Griffith's method of sluice discharges, whereas the original figures of 1905-06 were computed on the basis of the curve of 1900-01.

The figures of 1905-06 correspond to those of the curve of 1900-01.

The causes of discrepancies in figures of 1899-00 and 1906-07 have not been traced.

The figures for August 1898 in the river diagram is printed 6,666 whereas it ought to be 9,999.

The original of the figures for all years from 1896 except 1899-00 and 1906-07 has thus been traced.

For years prior to 1896 Madras original discharge diagrams are with Mysore.

The reason why Sir J. Benton's figures do not agree with the figures in the annual river diagrams is thus that given in Madras, Part VI, paragraph 63, *viz.*, that the basis of the discharges and of the crop period do not correspond.

This is now shown to be the case and the basis of each is now known.

W. M. Ellis, Col., R.E.,
Madras Representative.

Statement showing the average discharge at head of Cauvery delta during the irrigation season.

Years	Discharge in cusecs as given in columns 5 and 6 of Sir J. Benton's Appendix V		Discharge in cusecs computed from discharges shown in monthly river diagrams		Remarks
	First crop	Second crop	First crop	Second crop	
1	2	3	4	5	6
.....	.....	.....	.....	.....	Diagrams for years prior to 1896 have been sent to Mysore. In the Administration Reports the discharges of Cauvery only available.
1896–97	17,193	2,868	17,193	2,868	
1897–98	18,074	890	18,074	890	
1898–99	13,128	2,174	13,128	2,174	
1899–00	10,290	509	7,808	45	
1900–01	20,735	596	20,735	596	
1901–02	15,828	2,329	15,828	2,329	
1902–03	12,106	2,843	11,939	2,843	
1903–04	15,418	3,792	15,478	3,793	
1904–05	11,931	137	11,985	137	
1905–06	9,200	470	11,079	*1,065	*These are based on the diagram figures which are different from those from which the figures in columns 2 and 3 were deduced by the Executive Engineer for E I. statement.
1906–07	10,906	1,903	11,444	1,822	

First crop season taken as June to November inclusive.
Second crop season taken as December to March.
Note.—Discharge in column 4 is the average total discharge of June to November from river diagrams.
Discharge column 5 is the average discharge from December to March from annual river diagrams.

Appendix XXIII.

Note on differences of discharges for the same gauge readings, Cauvery dam, recorded in the curves of Captain Mead and Major Montgomerie.

From Major Montgomerie's diagrams of 1881 of the discharges of the Cauvery dam, it appears that the discharges computed by him in 1881 and those computed by Captain Mead in 1866 were calculated from formulæ noted below :—

Major Montgomerie's from Kutter's formula with co-efficient ·0325.

Captain Mead's from Bazin's formula with co-efficient 93.

2. With a view of testing from a similar section how far the discrepant results are due to the different formulæ used, actual computations have been made from each formula with a surface fall of 3 feet per mile for the discharge through a section of the river just below the Cauvery dam (as actually recorded in 1909) for gauge readings 5, 6, 7 feet on the Cauvery dam. The results are given below in cusecs :—

Gauge, Cauvery dam.	Discharge Captain Mead's formula.	Discharge Major Montgomerie's formula.
5	15,347	8,684
6	24,515	14,651
7	37,023	23,352

The discharges actually computed by Captain Mead in 1866 and Major Montgomerie in 1881 are as below ; also the gauged discharges of 1909.

	Cauvery dam gauge	Discharge, Captain Mead, 1866	Discharge, Major Montgomerie, 1881	Gauged discharge, 1909	
	5	14,340	8,150	11,600	
	6	25,200	16,500	18,850	
	7	38,010	27,230	26,680	

It will be seen that the differences between Major Montgomerie's and Captain Mead's discharges are almost altogether due to the different formulæ used.

3. The discharges of Major Montgomerie agree fairly with the gauged discharges of 1909 for stages of flow between 6½ and 7½ feet while the formula used is that recognised as a reliable one. The great discrepancies below 6½ feet between the gauged discharges and those of Major Montgomerie may be attributed to fallacy involved in the arbitrary assumption made by that officer that the amount of observation by sand deposit on the Cauvery Dam was a certain stated condition for each gauge reading being the same always for the same gauge and varying from *nil* at 7 feet to 60 per cent at one foot. The assumption is such as could not be correct as it is not the gauge reading of any day but the antecedent conditions of flow which have deposited or scoured the sand. Except as regards this the discharges of Major Montgomerie's computation agree fairly with the observed discharges.

4. While there may have been some variations in the quantity of sand deposited in the Cauvery bed, the variations of the discharges recorded are not due to this cause to any marked degree but are almost altogether attributable to the different methods of computation adopted.

Appendix XXIV.

Table of discharges Cauvery Dam from the curve of 1909 and of Cauvery and Vennar Regulators from the Assessor's curve.

Year	Discharges Cauvery Dam limit gauge within				Combined discharge Cauvery and Vennar Regulators				
	Total discharge	Seven feet limit	Six feet limit	Limits of Mysore proposed rules	From Appendix V, Sir J. Benton's Note of 12th May 1911	Total discharge from rear gauge readings	Limit gauge—Cauvery 6·2, Vennar 6·0	Limit gauge—Cauvery 5·5, Vennar 7·0	Limit—Cauvery 11,350 cusecs, Vennar 6,100 cusecs, from My. 9, Appendix—G-1
1	2	3	4	5	6	7	8	9	10
1890-91	225,302	204,209	175,108	163,431	129,078	206,273	198,795	187,965	162,603
1891-92	260,013	234,892	184,037	175,896	128,398	239,568	237,281	230,452	186,203
1892-93	282,643	244,637	212,045	204,940	143,184	252,178	244,222	234,713	190,506
1893-94	326,551	309,513	273,784	225,374	179,123	271,707	269,623	265,806	232,165
1894-95	217,923	207,779	195,549	184,351	125,501	202,534	199,774	195,978	172,581
1895-96	299,587	273,365	236,750	210,742	164,095	273,455	267,380	258,006	217,378
1896-97	422,540	310,678	259,962	225,999	227,560	382,001	357,134	320,607	244,141
1897-98	393,379	299,391	260,577	220,527	205,990	380,041	354,724	322,632	240,784
1898 99	351,568	315,730	274,879	210,491	173,508	330,999	325,927	308,437	250,172
1899-1900	166,457	157,199	139,785	132,123	117,312	159,638	159,593	149,248	129,116
1900 1901	391,181	270,580	221,267	210,753	229,671	343,867	314,673	277,405	211,697
1901-1902	334,082	303,263	236,895	219,432	204,621	286,573	283,978	268,652	218,501
1902-1903	293,619	263,964	239,716	191,965	173,109	230,862	228,973	217,580	190,263
1903-1904	407,641	349,395	291,018	224,944	223,146	298,002	289,286	277,749	236,499
1904-1905	250,736	216,300	180,760	162,033	128,933	201,218	200,591	195,579	163,569
1905-1906	185,994	176,636	164,931	158,659	165,265	156,740	156,740	155,722	138,573
1906-1907	243,397	223,131	197,226	183,140	185,701	173,194	173,194	171,468	*158,382
1907-1908	295,859	241,750	208,436	197,405	236,777	225,919	221,018	206,521	181,737
1908-1909	220,127	194,762	174,212	163,995	177,068	166,741	166,741	166,741	143,592
1909-1910	313,084	272,464	255,348	221,747	252,337	245,757	245,757	244,851	211,886

*Mysore figure corrected as there was an error in addition.

Appendix XXV.

Table revising and amplifying Mysore Appendix K (My. 7).

Year 1899-1900.

Months	Fortnights	Upper Anicut into Coleroon		Grand Anicut into Coleroon		Discharge over 150 yards calingulah		Total of columns 3, 4 and 5		Total observed discharge at Lower Anicut		Quantity due to leakage			Lower Anicut into Coleroon		Net quantity used for irrigation (column 7—column 9)		Quantity passed through Vadavar		Quantity required for direct irrigation 20 m.c.ft. per day		Net flow into Veeranam tank (column 11—column 12)		Average flow per day in Vadavar (column 11 divided by 15)	
1	2	3		4		5		6		7		8			9		10		11		12		13		14	
		a	*b*	*a*	*b*	*a*	*b*	*a*	*b*	*a*	*b*	*a*	*b*	*c*	*a*	*b*	*a*	*b*	*a*	*b*	*a*	*b*	*a*	*b*	*a*	*b*
June ...	I	...	...	1,568	1,568	...	...	1,568	1,568	4,173	4,177	2,605	2,609	2,609	4,172	4,174	1	3	...	...	...	...	...	...	...	...
	II	11,880	11,880	3,372	3,372	1,550	1,550	16,802	16,802	14,305	12,643	1,361	738	*—4,159*	8 203	11,893	6,102	750	608	618	219	220	389	398	41	41
													—4,597													
July ...	I	17,555	17,555	4,305	4,305	2,533	2,533	24,393	24,393	19,741	19,730	372	372	*—4,663*	18,389	18,326	1,352	1,404	873	873	297	297	576	576	58	58
													—5,035													
	II	497	497	...	...	168	168	665	665	2,018	2,018	1,353	1,353	1,353	1,078	1,078	940	940	263	263	160	160	103	103	18	18
August ...	I	239	239	...	...	70	70	309	309	361	364	341	344	55	...	...	361	364	60	60	60	60	...	...	4	4
													—289													
	II	62	62	...	...	30	30	92	92	924	924	892	892	892	52	52	872	872	144	144	136	136	8	8	10	10
September ...	I	1,927	1,927	...	...	540	540	2,467	2,467	4,202	4,202	2,222	2,222	1,735	2,872	2,872	1,330	1,330	418	416	241	241	177	195	28	28
													—487													
	II	5,127	5,127	...	...	912	912	6,039	6,039	7,084	7,084	2,298	2,298	1,045	5,640	5,640	1,444	1,444	579	579	297	297	282	285	39	39
													—1,253													
Total ...	...	...	...	...	...	...	...	52,335	52,335	52,808	51,142	11,384	...	*—1,193*	...	...	...	...	...	...	...	...	...	...	...	...
October ...	I	...	...	...	...	...	...	...	...	821	821	821	821	821	...	...	821	821	85	85	81	81	4	4	6	6
	II	...	...	...	...	...	...	...	...	6,004	6,065	6,004	6,065	6,065	6,141	5,080	764	985	497	489	298	298	199	187	33	33
November ...	I	...	...	...	...	...	...	...	...	956	950	956	950	950	204	204	752	746	190	190	181	181	9	9	13	13
	II	...	...	...	...	...	...	...	...	427	427	427	427	427	...	..	427	427	44	44	44	44	4	4	3	3
December ...	I	...	...	...	...	...	...	...	...	591	591	591	591	591	78	78	513	513	59	63	55	58	4	8	4	4
	II	...	...	...	...	...	...	...	...	264	264	264	264	264	....	...	264	264	8	8	8	5	...	...	1	1
January ...	I	...	...	...	...	...	...	...	...	72	75	72	75	75	...	...	72	75	...	...	...	...	...	...	...	...
	II	...	...	...	...	...	...	...	...	75	75	75	75	75	...	...	75	75	...	...	...	...	...	...	...	...
Total ...	...	...	...	..	...	...	...	...	...	9,210	9,268	9,210	...	9,268	...	...	...	...	...	...	...	...	...	...	...	...
Grand Total ...	...	...	...	...	...	...	...	52,335	52,335	62,018	60,410	20,594	...	8,075	...	...	...	...	...	...	...	...	...	...	...	...

Note.—Figures in column 5 (*b*) are those entered in Mysore statement. The source has not been traced.
Figures in columns (*a*) denote Mysore figures of Appendix K—Part II, My. 7. The figures in columns (*b*) denote the results of check as made by Madras.
Figures in column 8 (*a*) and the positive figures column 8 (*b*) are the sum of the difference of daily flow of column 7 and column 6 when former is greater.
The minus figures column 8 (*b*) in italics are the sum of the difference of daily flow of column 7 and column 6 when the latter is greater.
Figures in column 8 (*c*) are [column 7 (*b*)—column 6 (*b*)], minus figures being in italics.

Appendix XXV—*contd.*

Table revising and amplifying Mysore Appendix K (My. 7)—*contd.*

Year 1905-1906.

Months	Fortnights	Upper Anicut into Coleroon		Grand Anicut into Coleroon		Discharge over 150 yards calingulah		Total of columns 3, 4 and 5		Total observed discharge at Lower Anicut		Quantity due to leakage			Lower Anicut into Coleroon		Net quantity used for irrigation (column 7—column 9)		Quantity passed through Vadavar		Quantity required for direct irrigation 20 m.c.ft. per day		Net flow into Veeranam tank (column 11—column 12)		Average flow per day in Vadavar (column 11 divided by 15)	
1	2	3		4		5		6		7		8			9		10		11		12		13		14	
		a	*b*	*a*	*b*	*a*	*b*	*a*	*b*	*a*	*b*	*a*	*b*	*c*	*a*	*b*	*a*	*b*	*a*	*b*	*a*	*b*	*a*	*b*	*a*	*b*
June ...	I	...	...	...	...	...	..	...	...	4,630	4,255	4,630	4,255	4,255	4,619	4,249	11	6	...	...	...	...	...	...	..	...
	II	...	...	...	...	120	120	120	120	1,091	1,447	971	1,327	1,327	981	1,358	110	89	10	10	10	10	...	...	1	1
July ...	I	7,091	7,091	7,733	7,733	1,613	1,613	16,437	16,437	15,034	15,034	2,463	2,462 *—3,865*	*—1,403*	12,198	13,021	2,836	2,013	929	929	300	300	629	629	62	62
	II	23,916	23,916	11,142	11,142	2,278	2,287	37,345	37,345	47,162	49,767	11,445	12,422	12,422	43,031	47,519	4,131	2,248	841	843	226	226	615	617	56	56
August ...	I	444	444	1,322	1,322	991	991	2,757	2,757	6,264	6,208	3,507	3,451	3,451	3,982	3,992	2,282	2,216	679	679	267	267	412	412	45	45
	II	...	...	..	...	63	63	63	63	1,643	1,642	1,579	1,579	1,579	...	...	1,642	1,642	449	457	228	228	221	229	30	31
September ...	I	2,488	2,488	4,470	4,470	465	465	8,823	7,423	6,469	6,468	1,552	1,570 *—2,525*	*—955*	4,051	4,051	2,418	2,417	1,073	1,073	300	300	773	773	72	72
	II	...	..	...	...	27	27	27	27	1,495	1,495	1,468	1,468	1,468	...	...	1,495	1,495	324	271	166	163	158	108	22	18
Total ...		...	...	...	...	...	...	65,572	64,172	83,788	84,316	27,615	...	22,144	...	...	...	...	...	...	...	...	...	..	...	...
October ...	I	6,902	6,902	6,288	6,288	120	120	13,310	13,310	21,576	21,576	8,266	8,266	8,266	20,043	20,504	1,533	1,072	448	448	177	177	271	271	30	30
	II	14,509	14,509	11,296	11,296	416	416	26,221	26,221	38,439	35,883	11,584	10,028 *—366*	9,662	34,567	34,567	2,872	1,316	408	408	207	207	201	201	27	27
November ...	I	...	...	...	...	...	...	...	...	1,239	1,244	1,239	1,244	1,244	...	...	1,239	1,244	418	418	157	157	261	261	28	28
	II	...	...	...	...	...	...	...	...	1,866	1,802	1,866	1,802	1,802	460	460	1,406	1,342	876	875	300	300	575	573	58	58
December ...	I	...	...	...	...	...	...	...	...	976	976	976	976	976	...	...	976	976	142	142	121	121	21	21	10	10
	II	...	...	...	...	...	...	...	...	743	743	743	743	743	...	...	743	743	12	12	12	12	...	...	1	1
January ...	I	...	...	...	...	...	...	...	...	769	769	769	769	769	...	...	769	769	8	8	8	8	...	...	1	1
	II	...	...	...	...	...	...	...	...	1,381	1,363	1,381	1,363	1,363	408	408	973	955	227	225	131	129	96	96	15	15
Total ...		...	...	...	...	...	...	39,531	39,531	66,989	64,366	26,824	..	24,825	...	...	...	...	...	..	...	...	...	...	...	...
Grand Total ...		...	...	...	...	...	...	105,103	103,703	150,777	150,672	54,439	...	46,969	...	...	...	...	...	...	...	...	...	...	...	...

Note.—Figures in column 5 (*b*) are those entered in Mysore statement. The source has not been traced.
Figures in columns (*a*) denote Mysore figures of Appendix K—Part II (My. 7). The figures in columns (*b*) denote the results of check as made by Madras.
Figures in column 8 (*a*) and the positive figures column 8 (*b*) are the sum of the difference of daily flow of column 7 and column 6 when former is greater.
The minus figures column 8 (*b*) in italics are the sum of the difference of daily flow of column 7 and column 6 when the latter is greater.
Figures in column 8 (*c*) are [column 7 (*b*)—column 6 (*b*)], minus figures being in italics.

Appendix XXV.—*concld.*

Table revising and amplifying Mysore Appendix K. (My. 7)—*concld.*

Year 1906-1907.

Months	Fortnights	Upper Anicut into Coleroon		Grand Anicut into Coleroon		Discharge over 150 yards calingulah		Total of column 3, 4 and 5		Total observed discharge at Lower Anicut		Quantity due to leakage			Lower Anicut into Coleroon		Net quantity used for irrigation (column 7 —column 9)		Quantity passed through Vadavar		Quantity required for direct irrigation 20 m.c.ft. per day		Net flow into Veeranam tank (column 11 —column 12)		Average flow per day in Vadavar (column 11 divided by 15)	
1	2	3		4		5		6		7		8			9		10		11		12		13		14	
		a	*b*	*a*	*b*	*a*	*b*	*a*	*b*	*a*	*b*	*a*	*b*	*c*	*a*	*b*	*a*	*b*	*a*	*b*	*a*	*b*	*a*	*b*	*a*	*b*
June ...	I	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	II	657	657	...	...	657	...	...	657	...	...	...	...	*—657*	...	...	...	...	...	...	...	...	...	...	...	...
July ...	I	...	...	...	...	...	...	...	...	397	397	397	397	397	...	...	397	397	47	47	47	47	...	...	3	3
	II	31,744	31,744	14,160	15,307	3,293	3,293	49,197	50,344	67,140	67,144	18,123	17,158 *—358*	16,800	64,902	64,902	2,238	2,242	716	716	143	143	573	573	48	48
August ...	I	9,476	9,476	1,955	2,129	1,383	1,383	12,814	12,988	16,071	16,131	4,905	4,802 *—1,659*	3,143	12,953	12,953	3,118	3,178	1,220	1,220	300	300	920	920	81	81
	II	41,070	41,970	15,877	19,710	2,668	2,668	59,615	64,348	48,544	48,544	10,243	9,455 *—25,259*	*—15,804*	45,370	45,370	3,174	3,174	1,511	1,511	320	320	1,191	1,191	101	101
September ...	I	11,058	11,058	1,673	2,998	1,438	1,438	14,169	15,494	15,942	15,942	2,674	1,699 *—1,251*	448	13,144	13,144	2,798	2,798	1,055	1,116	289	300	766	816	70	74
	II	...	...	...	...	66	66	66	66	1,910	1,913	1,814	1,847	1,847	...	...	1,910	1,913	664	655	273	273	391	382	44	44
Total ...	...	...	...	...	...	...	...	135,861	143,897	150,004	150,071	38,156	...	6,174	...	...	...	...	...	...	...	...	...	...	...	...
October ...	I	8,280	8,280	...	2,551	1,142	1,142	9,422	11,973	10,901	11,302	2,520	1,267 *—1,938*	*—671*	9,015	9,015	2,086	2,287	742	742	261	261	481	481	50	50
	II	24,335	24,335	...	11,100	332	332	24,667	35,767	38,250	37,900	14,947	8,965 *—6,832*	2,133	35,579	36,115	2,668	1,785	1,447	1,445	320	320	1,087	1,085	94	94
November ...	I	...	...	...	1,885	...	...	...	1,885	11,881	9,738	11,881	7,853	7,853	10,006	7,866	1,875	1,872	789	789	294	294	495	495	53	53
	II	5,204	5,204	...	11,646	99	99	5,303	16,949	26,632	28,755	22,244	15,686 *—3,880*	11,806	24,595	27,921	2,018	834	766	766	200	200	566	566	51	51
December ...	I	...	...	...	3,859	...	...	...	3,859	6,486	6,486	6,486	3,352 *—725*	2,627	5,537	5,537	949	949	548	543	226	226	322	317	37	36
	II	..	...	...	2,693	42	42	42	2,735	4,626	4,626	4,581	2,060 *—169*	1,891	2,608	2,608	1,929	2,018	706	706	287	287	419	419	47	47
January ...	I	...	...	...	...	...	...	...	...	1,437	1,437	1,437	1,437	1,437	...	...	1,437	1,437	294	293	172	171	122	122	20	20
	II	...	...	...	...	...	...	...	...	857	848	857	848	848	...	...	857	848	121	120	89	88	32	32	8	8
Total ...	...	...	...	...	...	...	...	39,434	73,168	101,070	101,092	64,956	...	27,924	...	...	...	...	...	...	..	...	...	...	...	...
Grand Total...	...	...	...	...	...	...	...	175,295	217,065	251,074	251,163	103,112	..	34,098	...	...	..	...	...	...	...	...	...	...	...	...

Note—Figures in column 5 (*b*) are those entered in Mysore statement. The source has not been traced.
Figures in columns (*a*) denote Mysore figures of Appendix K, Part II (My. 7). Figures in columns (*b*) denote the results of check as made by Madras.
Figures in column 8 (*a*) and the positive figures, column 8 (*b*), are the sum of the difference of daily flow of column 7 and column 6 when former is greater
The *minus* figures column 8 (*b*) in italics are the sum of difference of daily flow of column 7 and column 6 when the latter is greater.
Figures column 8 (*c*) are [column 7 (*b*) — column 6 (*b*)], *minus* figures being in italics.

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Exhibit Ma. 15.

1910.

Statement of area of irrigation under the Cauvery channels between Bhavani and Upper Anicut requiring water between February and June.

No.	Channel	Second crop	Perennial	Total
		Acs.	Acs.	Acs.
1	Pogalore channel	887	...	887
2	Vangal channel	433	...	433
3	Nerur channel	262	...	262
4	Krishnaroyapuram channel	760	41	801
5	Mahadanapuram channel	341	57	398
6	Maradur Nattu voikal	3,581	1,190	4,771
7	Nangam voikal	1,277	228	1,505
8	Raja channel	2,920	...	2,920
9	Mohanur channel	1,535	...	1,535
10	Komarapalaiyam channel	991	...	991
11	Ayilur channel	580	...	580
12	Sipplaputhur channel	1,086	...	1,086
13	Tottiem Chinna voikal	2,131	...	2,131
14	Tottiem Periya voikal	303	...	303
15	Srinivasanallur channel	149	...	149
16	Musiri voikal	1,089	...	1,089
17	Amur voikal	414	...	414
18	Konasalam voikal	176	...	176
19	Uyyakondan channel	7,493	...	7,493
20	Ramavaithalai channel	294	...	294
21	Peruvalai channel	3,237	...	3,237
22	Panguni channel	2,088	...	2,088
23	Ayyan channel	9,944	...	9,944
24	Kattuputhur channel	1,827	900	2,727
	Total ...	43,798	2,416	46,214

NOTE.—Figures are not available for perennial crop for items 1, 2 and 3, 8, 9, 10 and 19 to 23.
In the case of items 11 to 18, it is reported that the area of perennial crop is included under second crop.

W. M. ELLIS, COL., R.E.,
Madras Representative.

7th January 1914.

Exhibit Ma. 15-a.

Statement showing the area of second and perennial crops under the channels fed by the Cauvery between the Bhavani and Upper Anicut for the years 1890, 1895 and 1900.

	1890		1895		1900	
	Second crop	Perennial	Second crop	Perennial	Second crop	Perennial
	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.
1. Pogaloro channel	...	...	...	...	1,053	...
2. Vangal channel	...	...	396	...	482	...
3. Nerur channel	1,312	...	1,180	...	143	...
4. Krishnaroyapuram channel	851	41	922	160	985	148
5. Mahadanapuram channel	498	42	413	111	404	4
6. Marudur Nattu voikal	3,257	642	3,496	1,484	3,437	713
7. Nangam voikal	1,298	623	889	591	793	326
8. Raja channel	...	...	...	...	...	...
9. Mohanur channel	...	...	...	...	...	...
10. Komarapoliem channel	...	...	...	...	...	...
11. Aiyulur channel	515	101	423	126	457	54
12. Sippliputhur channel	622	300	513	270	793	331
13. Tottiam Chinna voikal	957	395	1,688	679	1,600	530
14. Do Periya voikal	218	42	213	65	195	84
15. Srinivasanallur channel	31	64	270	200	201	89
16. Musiri voikal	661	46	1,292	64	799	56
17. Amur voikal	315	32	512	55	398	62
18. Konasalam voikal	200	7	364	15	220	29
19. Uyyakondan channel	4,916	...	5,462	...	6,069	...
20. Ramavaithalai channel	195	...	216	...	240	...
21. Peruvalai channel	1,326	...	1,558	..	1,832	...
22. Panguni channel	1,687	...	1,874	...	2,082	...
23. Ayyan channel	6,595	...	7,327	...	8,141	...
24. Kattuputhur channel	1,800	900	1,800	765	1,800	900
Total ...	27,324	3,232	30,808	4,585	32,124	3,326

NOTE.—Item No. (1)—Figures for second-crop for 1890 and 1895 and figures for perennial crops for the three years are not available.

(2)—Figures for second crop for 1890 and perennial crops for three years are not available.

(3)—Figures for perennial crops are not available.

(8) to (10)—No figures are available for the second and perennial crops.

(11) to (24)—It is reported that perennial crops are included with second crops.

W. M. ELLIS, COL., R.E.,
Madras Representative.

Exhibit Ma. 16.

Further Extract put in by Madras as Addenda to Exhibit A-7.

MAJOR MONTGOMERIE'S REPORT.

Paragraph 2.—"How long the Coleroon has been the main effluent of the Cauvery, or if it has always been so, is a disputed question which need not be taken into consideration here. It is sufficient, for the present inquiry, to know that, under the existing *regime* of the delta, the Coleroon below the Grand Anicut has a capacity sufficient to take one-half of the maximum discharge, which has to pass through the delta into the sea at any one time (*vide* table on sheet No. I or Appendices Nos. I and II). Its maximum discharge is almost the same as that of the Agunda Cauvery at the head of the Srirangam Island and is consequently about double that through the Cauvery Dam, or over the Upper Anicuts."

Comparative capacities of the Coleroon and the other rivers of the delta.

Paragraph 36.—"From what has been said on the subject, it must be sufficiently clear that, owing to the extent and geographical position of the delta, and the country draining directly into it, no scheme for the complete exclusion from the Delta proper the Grand Anicuts of all Cauvery floods except what is required for irrigation is either practicable or advisable,....."

Permanent exclusion of floods from the delta is not practicable.

Paragraph 38.—"From the general map of the Delta sheet No. I and the statement printed on it, some idea of the capacities to be given to these surplus outlets may be arrived at. They must in any case (to carry off local floods alone) have a combined capacity more than sufficient to carry off the whole of the possible maximum flood of 14 feet on the Cauvery Dam gauge; and as a maximum flood of 14 feet on the Cauvery Dam gauge occurs only once in about 50 years, and then probably in conjunction with a local abnormal flood in only one section of the delta, the extra capacity to be given to these outlets to take off the total discharge will depend upon the precision and the accuracy with which the upper floods are distributed and regulated among them. If this is properly done as it ought to be, the distributing rivers of the delta and their outlets will not be required to be increased in capacity and protected by flood banks very much more than will be absolutely necessary to withstand local floods alone. On the other hand, if the upper floods are not regulated, but merely distributed between each effluent in proportion to its capacity, it evidently follows that the distributaries and their outlets must have nearly twice the capacity which is required for local floods. Fortunately for the delta, the contracted state of the Cauvery and Vennar rivers at the head of the delta places a limit on the floods that can enter it, and this quantity is probably not more than 131,000 cubic feet per second."

Distributaries and local flood outlets need not be much increased above local requirements if upper waters are regulated.

Paragraph 39.—"The very great importance to the community at large of the proper maintenance and conservancy of the surplus rivers and channels, which, owing to the peculiar circumstances of the Cauvery delta, not infrequently remain for several consecutive years without being required to perform their own particular functions, has been repeatedly brought to notice....."

Maintenance and conservancy of surplus rivers and channels the fundamental difficulty in regulating floods.

Paragraph 44.—"....The site for the regulators selected by Captain Mead is by all agreed to be the only proper site. And there is no doubt that, had that officer been in possession of the further data now available, he would have seen the impossibility of passing over the Grand Anicut, with its low flat arches or 6 feet rise, and a clear waterway of only 2·75 feet between tops of dam stones and haunches, the very great bodies of water which must occasionally be dealt with,

and which may be as much as 180,000 cubic feet per second into the Coleroon. ....A vented dam similar to those to be provided to the Cauvery and Vennar heads, should undoubtedly be built in the place of the Grand Anicut."

The diminished water-supply accounts for apparent waste of water which has hitherto been supposed to be the case in Tanjore.

Paragraph 69.—" This would at once account for the apparent waste of water in the delta, and the persistent avidity with which the cultivators keep their sluices fully open even during high floods: and when we read the sagacious observations made by Major Oakes, R. E.,.....with the light now before us, we will at once see the correctness and force of his remarks, to the effect that it would probably be the ruin of the delta to limit the supply entering it to 3 or 5 cubic yards per hour per acre, to any other specified quantity; and that, in fact, the proper supply of the Cauvery delta cannot be estimated by the small intermittent quantities entering it during the lower stages of the river, and that in reality the delta is not receiving a proper supply until the rivers are actually in "good floods" as any native of Tanjore would express it."

Paragraph 70.—" The actual water-supply of the delta being only one-half that which has hitherto been considered the case, the storing of the surplus water in the upper valley of the river becomes doubly necessary; ....."

The objections to the afflux of sand into the delta.

Paragraph 75.—" As the control and manipulation of the sand along the river beds is effected with so much facility, the only possible objections to its entering the rivers of the delta are—

First.—The diminution of the waterway of the Cauvery at the head of the Srirangam Island, by which the supply of water which enters the delta in low freshes may be somewhat diminished.

Second.—The silting up of some of the irrigation channels, especially those in lower parts of the delta, by the influx of sand through their head sluices.

The first objection is more apparent than real as will presently be explained. But the second is one that cannot be altogether avoided....."

Paragraph 78—" .....It will be seen from the synoptical table of discharges accompanying this report that, although the volume of water which enters the delta by the Cauvery Dam is only 8,150 cubic feet per second when there is 5 feet on the gauge, the volume is increased to 16,500 cubic feet per second when there is 6 feet on the gauge. This latter quantity would give 2·67 cubic yards per hour per acre for the 800,000 acres irrigated and when there is 6 feet on the Cauvery Dam gauge, only 1,100 cubic feet per second escape over the Upper Anicuts, so that the delta receives very nearly a full theoretic supply of 3 cubic yards per hour per acre before there is any great waste over the Upper Anicut.

But, under the present conditions, under which the delta receives its water supply, the question really is, not what is a theoretic continual supply, but what would be the quantity which the delta could fully utilize in the event of a low fresh of, say, 8 or 9 feet on the Cauvery Dam gauge during the precarious season when every cubic foot of water would be of great value for the cultivation."

Mr. Hughes' Preliminary Report.

Paragraph. 10—" The Upper Anicut was built in 1836 across the head of the Coleroon and improved in 1843 by enlarging the scouring sluices in the hope of preventing the accumulation of sand and silt above the anicut. An estimate for cutting down the anicut 4 feet and fitting 6 feet lift shutters on it has been recently sanctioned and the work will be put in hand this year. In 1845 a dam was built across the head of the Cauvery 6 feet below the anicut crest for 1,650 feet length with two steps each 150 feet × 1¼ feet at either flank making the total length 1,950 feet. It is not known what the level of the Cauvery bed was at the time this dam was constructed. For a great many years past, it has been practically permanent in its average level (during low water at least) of 3 feet below anicut crest."

MR. LARMINIE'S REPORT.

Paragraph 26.—"I cannot agree with the argument that during the earlier months of the season much of the present supply could be dispensed with; the usual theoretic considerations as to quantity of water and area under plough cannot with safety be applied. The practical fact remains, that under the present *regime* it is only possible in the earlier half of the season (speaking broadly) to start and carry through the cultivation of the western half of the delta. Were the present supply reduced, the progress of cultivation would be still more retarded."

Paragraph 31.—"But it seems almost superfluous to seek for arguments in favour of maintaining a full supply all through the irrigation season, the advantages of doing so, being so clearly proved in numerous instances".

Six feet on the Cauvery Dam only means 2½ cubic yards per acre per hour for 910,000 acres by no means an excessive supply considering the character of the irrigation channels.

Paragraph 48.—"From the foregoing table, it will be seen that the excess discharge, *over that due to six feet*, at the Cauvery Dam *plus* the discharge over the Upper Anicut during the same period of 37 days in an average year, amounts to 125,348 million cubic feet or as much as one of the years of maximum discharge of the Bhavani at the Kodiveri, while the actual discharge over Todivelli Anicut during the same period (or nearly so) was 21,875 million cubic feet or 17½ per cent. of the former. These figures, rough though they may be, conclusively show the large amount* of water, which goes to waste through the Coleroon and Cauvery, the excess discharges over what is required to maintain full supply for irrigation being 56,359·929 and 68,987·808, respectively, quantities large enough to fill very large reservoirs on either the Cauvery or in Pattukottai or both and this leads to the consideration of the question of a reservoir, on the Cauvery, which has also been talked of for a long time."

Water stood over six feet at the dam for 78 days, 37 is the number of days water stood at the depths given in the table.

* This statement is not advanced as a new discovery.. It has of course been well known for years.

Paragraph 49.—"I have endeavoured to show, as I am convinced would be the case, that the construction of a large reservoir on the Bhavani, could not be carried out without interfering with the supply to Tanjore to a most injurious extent. While, on the other hand, a very large reservoir could be formed on the Cauvery without so interfering in any way."

"Such a reservoir would admit of six feet being maintained on the Cauvery Dam all through the irrigation season, and, were this accomplished, further improvements in Tanjore might safely be left to the raiyats; while the irregularities of cultivation would very soon disappear."

Above Bhavani town, the catchment of the Bhavani is 2,480 square miles, while that of the Cauvery above the same point is 15,029 square miles.

Paragraph 52.—"*To sum up*—The backward and irregular rate of cultivation in Tanjore being due to a short water-supply prevailing off and on throughout the irrigation season, if the district is to be materially benefited, it can best be done by insuring a full and regular supply at its head source, the Cauvery Dam."

COLONEL SMART'S REPORT.

Appendix I.

Paragraph 5.—On the Coleroon side there are two channels taken off above the Lower Anicut and which do not come under its influence—the Ponneri and Manniyar. The Ponneri gets a full supply with a rear gauge reading of 5 feet when C. D. reads 6·50 to 7·0, but the channel gets some land drainage. The Manniyar only begins to receive a supply when C. D. reads 6; it is really dependent on local surplus and on any supply that can be spared directly from the Cauvery. If the

delta supply is increased from 15th September to 15th October, as proposed under the Cauvery reservoir, the supply of the Manniyar will be much improved. The irrigation under the channel is always included in that of the Cauvery. At the Lower Anicut there are three channels, the North and South Rajan channels, the supply of which is secured and the irrigation under which rarely requires protection. The supply of the Vadavar, a high level channel, with a fall of only 6 inches per mile, is, however, often deficient and the irrigation under it, and the Veeranam tank, containing when full a fortnight's supply for the area under it, then suffers. The area under the Vadavar and the Veeranam tank requires protection when the Tanjore irrigation is suffering, and if gauges are reduced as proposed by Mr. Hughes, the work done in raising the Coleroon Anicut will be neutralized during the proposed reduction.

Paragraph 6.—The facts with regard to "abnormal" supply were known to the older Engineers, as, on the Vennar side where the area drained is considerably greater than on the Cauvery, the full "normal" supply was fixed at 2 cubic yards per hour per acre, whilst the Cauvery supply was taken at 3 cubic yards per hour per acre. The following extracts also show this:—

Colonel Oakes in his report printed with G. O. No. 1894, dated 16th June 1866, says, five feet of water over the Cauvery Dam ought to afford a full and sufficient supply to the irrigation dependent on the Cauvery. The first great branch from the Cauvery is the Vennar, and though the cultivation below the point of bifurcation under these rivers bears the proportion of about 9 to 10 the waterway over the respective dams is nearly 7 to 4 so that the Cauvery receives far more than its share of water, and yet owing to the defective state of the river the Mayavaram taluk does not receive a sufficient supply unless 7 feet of water are flowing over the Cauvery Dam, or until the district receiving nearly double the supply it ought to require, and even then a portion of the Shiyali taluk receives but a very scanty supply. The cultivation in this taluk, I should however mention, is, and always has been, in a great measure, dependent upon local rain during the north-east monsoon for its supply of water." (And Colonel Oakes might well have added parts of Negapatam and Tiruturaipundi taluks).

Paragraph 11.—It is submitted that the statement that Colonel Oakes *evidently considered* that five feet permanent supply was sufficient is not supported by paragraph 11 or the extract quoted in this by Colonel Smart. The whole of paragraph 11 and the extract is re-quoted *verbatim* with Colonel Smart's marginal note.

"As 6 C.D. is the undoubted standard of Tanjore there should be no reduction on that gauge *for storage*, and, in order to prevent any loss to the irrigation above the Upper Anicut and under the Coleroon, I have proposed that, during the south-west monsoon, there should be no storage below 6·5 C.D. This, in my opinion, should be at once declared the absolute minimum. Colonel Oakes, who had a very long experience of the district, was of opinion that water should not be stored below 8 C.D. during July and 7 C.D. during August, as the following extract from his report printed with G. O. No. 1894, dated 16th June 1866, paragraph 9 will show:—

"'But reservoirs for storing water for purposes of irrigation capable of containing 800,000,000 cubic yards of water would be invaluable. 'During the past ten years such reservoirs by retaining all 'water over 8 feet above the Cauvery Dam in July and that 'above 7 feet in August in bad years could have been 'filled every year with the exception of 1858, when the 'south-west monsoon failed and could have maintained a 'permanent depth of 5 feet of water on the Cauvery Dam 'for four months in 1859 and 1862, for three and a half 'months in 1856, 1857, 1860, 1863, 1864 and 1865 and for 'nearly three months in 1861, and this not *by robbing the 'district of its water when the floods were low, but by relieving it of some of the superfluous water it did not require 'when the floods were high*, they would have tended to 'prevent injury to the river banks in the delta.'

The maximum now admitted into the delta is equivalent to about 7½ C. D. or 7½ on rear gauge, Cauvery and 8½ feet on rear gauge, Vennar. A full fresh which is amply sufficient for all purposes is 7 C. D. giving 6 feet rear gauge, Cauvery, and 8 feet, Vennar, at Cauvery-Vennar regulators; 7 C. D. is calculated to give 27,000 cusecs to the delta with 8,000 spill into the Coleroon or 35,000 cusecs in all; a good fresh is given by 6·5 C. D.

"Colonel Oakes thus supports my view as to storage though he places the limit under which storage should not take place considerably higher than I do. Whether my limit should be raised will have to be considered when the necessary full investigation has been undertaken, but we may say at once that it cannot be lowered as proposed by Mr. Hughes."

Paragraph 12.—The conditions of irrigation in Tanjore have not altered since the days of Colonel Oakes. A number of regulators have been built both on the Cauvery and Vennar and it is possible that we have obtained more command with smaller gauge readings at the Upper Anicut; but my experience, which, I believe, will be borne out by local officers, is that 6 C.D. is a minimum required (1) from July to 15th August. On the Vennar all main regulators have been built and yet 6 C.D. is required to give flush irrigation on that side. . On the Cauvery the regulators proposed to be built may bring the Mayavaram and Shiyali lands which, as Colonel Oakes observed, require 7 C.D. for full supply within the 6 C.D. limit; but it will certainly do no more. . . . .

Neringipet Project—G. O. No. 971-*I. of 2nd August* 1904.

The various reports of Colonel Smart regarding drainage of the delta and regarding construction of separate specific works have been produced and perused by the Assessor.

Mr. Higham's Note— ". . . . It follows first, that the construction of a large storage work is obligatory, if any material increase of existing irrigation is to be contemplated; and secondly, that if such a work is constructed the onus of proving to the satisfaction of the courts that water is stored only when in excess of requirements for old irrigation, will lie with the Government or officers of the Irrigation Department. The reservoir must be designed with reference to this all-important consideration."

Mr. Moss' Report.—Page I.—". . . . The average total yearly discharge of the Cauvery at the Upper Anicut is 450,000 millioo cubic feet . . . . of the total discharge 270,000 million cubic feet is supplied by the south-west monsoon and 180,000 million cubic feet by the north-east monsoon . . . ."

Last Bhavani Project.—Page 3.—" Mr. Moss reported that, while the discharge of the Upper Bhavani amounted to 36,000 million cubic feet per year, the quantity that could safely be utilised could not be more than 5,000 million cubic feet."

Exhibit Ma. 17.

Note on cross section of the Cauvery between Cauvery Dam and the Grand Anicut.

The only sections of the Cauvery between the Cauvery Dam and the Grand Anicut before remodelling which are forthcoming is a set of sections of Captain Mead of 1867.

It is on record that a section of the Cauvery in 1899 was existent in 1909. It is most unfortunate that this section about which enquiries have been made during the last two years should have been lost.

Subsequent to remodelling there are sections at a short distance below Cauvery Dam in 1902, 1903 and 1906.

There are sections of 1905 and 1906 plotted and again sections of 1909. The sections of 1909 were taken as near the positions of sections of 1867 as possible. The position appears to have been located by measurement on the plan of 1867.

The sections of 1905-1906 appear to have been located in the same way. There is in the case of these sections some doubt as to the exact location except in regard to Trichinopoly bridge and the 150 yards calingulah.

Fortunately, these are more important than the sections lower down, being 3 and 9 miles from the Cauvery Dam. As regards No. 1 section, this was taken in 1867 and 1909 over the site of the Cauvery Dam.

It is not clear where the sections of 1905 and 1906 were taken except they were not at this place as the flanks of the section show *nanal padugai* which is not found in the immediate vicinity of the Cauvery Dam and the width of river is altogether different.

The only sections clearly located are those of 1867 and 1909 at the Cauvery Dam and 1867, 1905, 1906 and 1909 at the 150 yards calingulah and at Trichinopoly bridge.

The examination of the sections do not lead to any very definite conclusions. On the whole there is no well defined tendency either to silt or scour.

The section of 1867 at the Cauvery Dam shows a mean bed level not differing materially from that of 1909, while the average does not very materially differ from the 3 feet over the Cauvery Dam which Mr. Hughes states to have been known to be the general average for many years previous to the time of his writing in December 1898: he says, "It is not known what the level of the Cauvery bed was at the time the dam was constructed. For a great many years past it has been practically permanent in its average bed level (during low water at least) of 3 feet below the anicut crest."

Examining the sections of 1867, 1905, 1906 and 1909 at the 150 yards calingula and Trichinopoly bridge, it is clear that there has been rather a tendency to silt since 1867; but, on the whole, making allowance for annual fluctuations, no very great changes are recorded.

The lower cross sections are not so clearly located and show in some cases results which appear quite unreliable, especially as regards the 1905 and 1906 sections, Nos. 11 and 13. In respect to this, the Executive Engineer who sent them to this office remarks in his No. 737-S.E., dated 22nd August 1912, "In cross sections, Nos. 11 and 13, the levels of 1905 show an abnormal rise of the river bed at these places when compared with the levels of other years and at other places, it seems possible that the levels have been connected to a wrong B.M. or datum, but in the absence of field books this cannot be verified."

Generally it is submitted that the sections show that no very material change in the upper part of the Cauvery has taken place and whatever evidence there is regarding the deposit of shoals on the Cauvery Dam supports Mr. Hughes' statement of 1898 that there has been no material change. The loss of the sections of

1899 was very regrettable, but it is considered that Mr. Hughes' statement certainly would have applied to the condition of the shoals about the time at which he wrote which was the time when the remodelling of the Upper Anicut was sanctioned.

8th January 1914.

W. M. ELLIS, COL., R.E.,
Madras Representative.

Exhibit Ma. 17-a.

Letter No. 201—Arb., dated 10th January 1914, from the Hon'ble Col. W. M. Ellis, R.E., Acting Joint Secretary to the Government of Madras, Public Works Department, Irrigation Branch, to the Inspector-General of Irrigation and Assessor, Mysore-Madras Arbitration.

With reference to your proceedings of 8th instant, I forward a statement of the further information regarding the average bed levels of the Cauvery called for.

I send a second copy which I would ask you, if you approve, to forward to the Mysore Representative.

LEVELS OBTAINED FROM SECTIONS OF THE CAUVERY.

Information called for by the Assessor.

A table giving the information called for by the Assessor in the Proceedings of 8th January 1914 is attached.

2. The table shows the reduced mean bed levels of the Cauvery from sections of 1867 and 1909 at—

(*a*) the Cauvery Dam;

(*b*) the 150 yards calingulah 3 miles below the Cauvery Dam;

(*c*) Trichinopoly bridge 9 miles below the Cauvery Dam.

3. The mean bed level of the Cauvery at the Cauvery Dam works out to—

1867	...	...	...	...	2·26 feet above crest.
1909	...	...	...	...	2·94 „ „

Mr. Hughes (Chief Engineer for Irrigation) writing in December 1898 just before the work of remodelling the Upper Anicut was commenced, states that the mean bed level at the Cauvery Dam had been practically unaltered for many years and averaged about 3 feet over the crest of the Cauvery Dam.

This is about 9 inches higher than shown in the section of 1867 but agrees very closely with the section of 1909.

4. The table shows mean bed levels (reduced to a different datum level) of the Agunda Cauvery 1,000 feet above the Cauvery Dam and Upper Anicut and of the Cauvery 1,000, 2,000 and 3,000 feet below the Cauvery Dam in 1902, 1903 and 1906.

5. As regards the section of the Agunda Cauvery 1,000 feet above the Upper Anicut, the river is here 4,700 feet wide and it is reasonable to consider separately the mean bed level of the right and left halves of the section, the right half being the section immediately above the Cauvery Dam (1,950 feet length), while the left half is that which is immediately above the Upper Anicut and which one would expect would be more specially affected by the remodelling of that work. This one sees is the case as the level in the right half remaining practically unaltered throughout the period while in the left half there is a continuous reduction of level of the sand deposits.

W. M. ELLIS, COL., R.E.,
Madras Representative.

Table showing mean bed levels of the Cauvery in years 1867 and 1909.

—	1867	1909	Difference
(*a*) Cauvery Dam	290·46	291·14	+0·68
(*b*) Mean bed level Cauvery at 150 yards calingulah	281·21	281·36	+0·15
(*c*) Mean bed level Cauvery at Trichinopoly	262·27	262·99	+0·72

Table showing mean bed levels of the Cauvery in years 1902, 1903 and 1906.

—	1902	1903	Difference between 1902 and 1903	1906	Difference between 1902 and 1906
CAUVERY.					
(*d*) Mean bed level Cauvery 1,000 feet below Cauvery Dam.	237·70	237·86	+0·16	238·84	+1·14
(*e*) At 2,000 feet below Cauvery Dam	238·37	238·17	—0·20	237·33	—1·04
(*f*) At 3,000 feet below Cauvery Dam	238·61	235·82	—2·79	236·73	—1·88
(*g*) *Agunda Cauvery*— 1,000 feet above Cauvery Dam and Upper Anicut—					
Right half of section	239·31	239·84	+0·53	239·25	—0·06
Left half of section	242·06	241·30	—0·76	240·63	—1·43
Whole cross-section	240·68	240·57	—0·11	239·96	—0·72

NOTE— + Figures show increase in sand deposit.
decrease in sand deposit.

Exhibit Ma. 17-b.

Note dated 13th January 1914 regarding levels of the river-bed at the Cauvery Dam.

In continuation of the statement attached to letter No. 201-Arb., dated 10th January 1914, from the Joint Secretary to Government of Madras, to the Assessor and Inspector-General of Irrigation, a set of annual river survey charts of the head-works at the Upper Anicut and Cauvery Dam for the years from 1885-86 up to 1910-11 have now been found and examined.

The chart for one year 1901-02 only is missing and it is believed that, on account of the extensive works in progress at the Upper Anicut, it is probable that no chart for that year was prepared. The charts for the remaining 26 years are available for examination.

2. From the sections of 1867 and 1909 already examined, the mean bed-level at Cauvery Dam were found to be—

1867—2·26 feet above the crest of the Cauvery Dam.
1909—2·94 do do

3. A table of yearly mean levels along the line of the dam for the above 26 years has been computed and is attached.

It will be seen that the maximum mean level was 4·03 above the dam crest, in 1900-01, and the minimum 2·07 in the preceding year.

Fluctuations of level occur from year to year between these extreme limits, but there is nothing throughout the whole period to indicate any material change in bed level or conditions of silting.

In 1898, Mr. Hughes wrote that the mean level had not materially varied for many years and was about 3 feet.

The record of these charts shows that from 1885-86 to 1898-99 the average works out to 2·83 feet. Omitting the three years during which works were in progress and taking the average of the years 1902-03 to 1910-11, this works out to 2·85, being materially the same average for the ten years after remodelling as for the 14 years before and varying from year to year between about the same limits.

4. In view of all the facts now available, it is submitted that the record shows no indication of any marked change between 1885 and 1910 and that the section of 1867 points to materially similar conditions prevailing at that time.

The average depths over the Cauvery Dam recorded are—

Before remodelling—2·83 feet varying between 3·44 and 2·14.

After remodelling—2·85 feet varying between 3·35 and 2·28.

W. M. ELLIS, COL., R.E.,
Madras Representative.

Years	Above Cauvery Dam crest 236·24	Reduced mean bed levels of the Cauvery at Cauvery Dam	Remarks
1867	2·26	238·85	From old section.
1885—86			
1886—87	2·86	239·10	
1887—88	2·14	238·40	
1888—89	2·64	238·88	
1889—90	3·17	239·41	
1890—91	3·11	239·35	
1891—92	2·72	238·96	
1892—93	3.13	239·37	
1893—94	2.96	239·20	
1894—95	2·85	239·09	
1895—96	2·94	239·18	
1896—97	3·44	239·68	
1897—98	2·90	239·14	
1898—99	2·08	238·32	
	2·64	238·88	
Total ...	39·58	.....	
Average ...	2·83	.....	
1899—1900	2·07	238·31	
1900—01	4·03	240·27	
1901—02	.....	.....	No chart map available.
1902—03	2·90	239·14	
1903—04	2·88	239·18	
1904—05	2·50	238·74	
1905—06	2·28	238·52	
1906—07	2·79	239·03	
1907—08	3·28	239·52	
1908—09	3·35	239·59	
1909—10	2·98	239·22	
1910—11	2·68	238·92	
Total ...	25·64	.....	
Average ...	2·85	.....	

Exhibit My. 10.

Extract from the Report of the Indian Irrigation Commission, 1901-1903, Part II.—Provincial.

PAGE 228.

"624. *Rainfall and Famines.*—The province is so situated that it receives the rainfall of both monsoons. That from the south-west brings rain from the middle of May to about the middle of September and that from the north-east from September to about the middle of November. The amount received varies enormously according to the locality. At one point on the Western Ghauts the annual average is said to exceed 350 inches, while at two of the recording stations in the Chitaldrug District it is barely 17½ inches. For the recording stations situated in the ghauts close to the western border, the average is over 140 inches; but the rainfall rapidly decreases as the clouds drift eastwards, and at a distance of 30 miles from the border the average is only 34½ inches, while at 50 miles off it is only 25 inches. Eastward of this the average is about 28 inches in the south-eastern portion of the province, and about 22 inches in the north-eastern portion which, as a rule, receives only a scanty share of either monsoon.

"625. Previous to 1876-77, there is no record in the history of the province of any considerable famine caused by drought alone. Famines had followed on the devastations of hostile armies, and partial failures of the rains had led to severe scarcities in 1824, 1833 and 1866; but these latter were of short duration, and until the failure of the rains of 1875, and the still more deficient rainfall of 1876, the province was looked upon as practically immune from very prolonged drought. In these two successive years it received only about half its average rainfall. The result was a famine which fell with appalling severity on the districts of Chitaldrug, Tumkur, Bangalore and Kolar, and in fact on the whole two-thirds of the State lying east of a line drawn through the town of Mysore parallel to the Western Ghauts. The province lost about one-fifth of its population; the treasury a year's revenue or over a million sterling; while the loss to the people in produce, cattle and other property, was estimated at nearly 9¾ millions sterling. Since then there has been no serious failure of the rains, but the rainfall has often been deficient or unfavourably distributed throughout the season.

"626. *Value of Irrigation.*—Experience, then, has shown that everywhere through the province save in a narrow strip of assured rainfall along the western border, irrigation is necessary as a protection against occasional famine and the vicissitudes of ordinary seasons; while, throughout the whole province, it is useful in affording employment to the agricultural classes in the interval between the reaping of the dry crops in December and the setting in of the rains in May. None of the more valuable crops, such as sugarcane, garden produce and the best qualities of rice, can be grown profitably without irrigation; and on an average the value of the produce of a single crop is said to be nearly quadrupled in ordinary years by an assured supply of river water, and increased thirty-fold in a year of drought. But perhaps the best index to the value of irrigation in Mysore will be found in the fact that, though the irrigated lands comprise only about 15 per cent of the whole occupied area, they pay about 40 per cent of the total land revenue of the State.

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PAGE 231.

"637. *Progress made since the famine of 1877.*—Before passing to the question of the scope which exists for the further extension of irrigation works, it is desirable to consider briefly in what respects Mysore is now better fitted than it was in 1875, to withstand a serious famine. The most important advantage gained lies no doubt in the improvement of the means of communication. During the famine there was but one short line of rail in the whole province—the branch line from Jolarpet terminating at Bangalore, its total length within the province being

"little more than 40 miles; and "upon the traffic carried along this single iron thread throughout 1877, hung the lives of a million of souls."* Every district in the Province is now either traversed by or has its main town connected with a railway, and the total length of line within the province has been increased to over 450 miles. In addition to the extension of railways, more than 1,000 miles of new roads have been opened out and a number of large rivers bridged at a total cost of over 60 lakhs. The opening out of the Kolar Gold Fields has also created a new and important source of industry, which is said to afford employment to about 40,000 people in a district unusually liable to drought.

"638. These improvements are a substantial addition to the general wealth and well-being of the province, while the increased means of communication will enormously facilitate relief operations in the contingency of another famine. But with regard to the amount of protection afforded by irrigation, a matter with which we are more immediately concerned, it cannot be said that any very distinct advance has been made. Writing in 1877, the Famine Commissioner estimated that before the famine there was more than one acre of cultivation to each head of the population, and that about 15 per cent of the cultivated area was under irrigation. So far as we can gather from the data which have been supplied to us, the conditions now are much the same as they were then. The proportion which the irrigated area bears to the whole area of cultivation certainly does not appear to have increased by more than 1 per cent.

"639. Under river channels, which are described as the most valuable form of irrigation in Mysore, a distinct advance has no doubt been made, and the area irrigated by these works has been nearly doubled within the past 25 years. But this means an increase of only 5 per cent to the whole irrigated area of the province, and the increase is confined for the most part to the districts which are least liable to famine. Large sums have also been liberally spent in improving the tanks, but most of this expenditure seems to have been necessary to prevent retrogression, and it is not said to have led to any considerable increase in the tank irrigated area. On the whole, however, the extension of irrigation has fully kept pace with the increases in population and cultivation; and all things considered, the State is now, no doubt, much better equipped to meet famine than it was in 1875. The position, as regards the district most liable to be affected by drought, will be still more improved when the great Marikanave tank is completed.

Scope for further Extensions of State Irrigation Works.

"640. *General remarks.*—Outside of the area covered by the Western Ghauts, nearly every suitable site has been already occupied by a storage work. The only means of providing any considerable extension of irrigation in Mysore must therefore, as in the case of the Deccan districts of Bombay, be sought for in a system of canals depending for their supplies on large storage works in the western region of assured rainfall. Unfortunately, the main rivers of Mysore, having their sources in the Western Ghauts, do not traverse the districts most liable to famine. Their courses lie close to the ghauts in deep valleys which separate the secure tracts on the west from the precarious plateau districts on the east. The Thungabhadra flows almost due north through the districts of Kadur and Shimoga, while the Cauvery and its main tributaries flow to the south-east through the districts of Hassan and Mysore. Storage works in the basins of both these rivers would be useful—on the Thungabhadra they would be invaluable to the district of Madras which they subsequently traverse, but they would be of little use to Mysore. The only portions of the State that could be commanded by them lie in the tract that least requires protection. All the difficulties that we have referred to in connection with the utilization of the rainfall of the ghauts in the Deccan districts of Bombay are here intensified. The courses taken by the rivers, the general level of the country, and the broken nature of its surface, would all be serious obstacles against any attempt to carry the abundant rainfall of the ghauts on to the main plateau of the province. These difficulties might no doubt be overcome, but in all probability the cost would be quite prohibitive. Nevertheless, the question is, we think, one of such vital importance to the State that no opinion on this point should be accepted

* Report on the History of the Mysore Famine of 1876-1878 by Mr. Charles Elliot, C.S.I. Famine Commissioner.

"as final, until a thorough and systematic reconnaissance has been made by a specially qualified Engineer. Should no possible means be discovered for utilizing rainfall stored in the Ghauts, Mysore will have to rely, for any extension of its irrigation by means of State works in the tracts liable to famine, upon the improvement of its existing tanks and channels and upon the construction of new works for the storage of local rainfall in the comparatively few catchments which are not already fully occupied.

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PAGE 233.

"643. *River channels and ghaut-fed storage works.*—The existing dams are sufficient to draw off all the supply generally available in the rivers during the dry weather; and even if this were not the case, the Madras Government would object to any interference with the surplus, or the construction of any work likely to reduce the present dry weather supply of the canals in that Presidency. Hence, for the supply of any new canals in Mysore, or to increase the dry weather supply of existing canals, it will be necessary to construct large storage reservoirs on the main rivers or their tributaries, and within the region of assured rainfall. We understand that sites for such works are now being systematically investigated, and that the discovery of suitable sites on the Cauvery or its branches will lead to a very large increase on the area under river channels; though, as we have already stated, it will probably be impossible to extend this form of irrigation to the tracts which are most in need of protection. The works, however, are, as we have shown, very remunerative, and the extension of these channels, even within the limits of the western districts, will be of very great benefit both to the cultivators and to the State. The investigations previously made, apparently in no very systematic way, have resulted in the discovery of only one possible site in the valley of the Cauvery; and even this has not proved practicable, for the construction of a reservoir would submerge the town of Fraserpet. A more thorough investigation, which should include those portions of Coorg and of the Madras Presidency lying within the upper valley of the river, may, however, lead to the discovery of other and more practicable sites. In the valley of the Thungabhadra some excellent sites have been found at Lakvalli and Mudaba; but, as we have said, reservoirs at these sites, though of great value to Madras, would apparently be of little use to Mysore. The site at Lakvalli has a catchment of 776 square miles with an average rainfall of 150 inches. It is situated in an unhealthy tract and in the midst of valuable forests of teak; but in all other respects it is said to be one of the finest sites for a reservoir in the whole of India.

"644. But, even if the investigations should result in the discovery of but few suitable sites for new storage works, our evidence leads us to think that the area irrigated by river channels could be largely extended by improving the existing works. The Chief Engineer estimates that to provide proper masonry dams and to improve and extend the channels would cost about 25 lakhs. We think that the results would justify the expenditure but this could easily be tested by remodelling a few selected works.

* * * * *

"647. *Cost of proposed new works and possible increase in the area irrigated.*—Excluding the two works under construction, the list of proposed new works contains 48 works estimated to cost 107·5 lakhs, and to irrigate 107,000 acres in a year of ordinary rainfall and 56,000 acres in a year of drought. Of the latter area, only one-fifth lies in the precarious eastern districts. These figures are not based on detailed surveys or estimates. They are admittedly only a rough approximation, and they do not include all the extensions that may be rendered possible by the construction of ghaut-fed storage works, and by minor improvements which collectively should have an important effect. But we fear that they indicate generally and, at least as regards the tracts most liable to famine, with sufficient accuracy, the limited field that exists for the extension of irrigation in Mysore by means of new State works. Such possibilities as there are, will, we have no doubt, be fully utilized in the near future by a Durbar which has proved itself so liberal in the past in providing funds for the general improvement of the province."

Exhibit My. 11.

Copies of correspondence relating to the Marikanave Reservoir Project.

Letter No. 834-142 dated the 17th February 1892, from Colonel C. Bowen, R.E., Secretary to the Government of Mysore, Public Works Department, to the First Assistant to the Resident in Mysore.

I have the honour, by desire of the Dewan, to request you will be good enough to move the Resident to ascertain whether the Madras Government have any objection to the great Marikanave Reservoir, across the Vedavati river, a project which has been under discussion for very many years, being now taken in hand.

2. The Durbar propose in the first instance simply to attempt to get in perfectly secure foundations for the great dam. The nature of the rock and adjoining strata indicate that this attempt may fail, in which case the project would have to be altogether abandoned. But should the endeavour prove quite successful, the dam will be built to impound the maximum discharge and irrigate as much as possible of the irrigable area up to the Bellary frontier.

3. I annex, for information, copy of a Memorandum by Colonel Le Messurier, R.E., which gives a brief history of the project and what is now proposed. Until the difficulties connected with the foundations have been overcome, it would, of course, be useless to discuss the details of the work itself; but when the time comes for taking these in hand they will, if thought necessary, be admitted for the acceptance of the Madras Engineers.

No. 58-I.

Note by the Chief Engineer for Irrigation.

The Vedavati or Hagari river is No. 4 of Schedule A of the rules lately agreed to by the Madras Government and the Mysore State. See Proceedings of Madras Government No. 162-I., dated 18th February 1892. It is an affluent of the Tungabhadra and has drainage area above the site for the proposed reservoir of 2,075 square miles or about one-tenth of the Tungabhadra above the Sunkasala anicut.

See paragraph 8 of Colonel A. Le Messurier's Memorandum, dated 9th October 1885.

2. Below the infall of the Vedavati there are taken off from the Tungabhadra the following channels and systems of canals, *viz.*—

(*a*) The Rampur channel irrigating 888 acres.

(*b*) The Kurnool-Cuddapah canal, the works of which were constructed for the irrigation of some 200,000 acres and now supplies about 30,000 acres of wet cultivation, whilst in years of deficient rainfall a large area of dry crop is watered; in 1876-77 the area of "wet" crop and "dry" watered amounted to 90,285 acres.

(*c*) The Kistna Canals from the Bezwada anikat, the works connected with which are still in progress which already irrigate in (1890-91) upwards of 463,000 acres and will before long irrigate not much under 500,000 acres.

3. There are times, chiefly during the south-west monsoon, when more water passes down the Tungabhadra and Kistna than can be utilised by the works named, and some of it flows uselessly to the sea; at such times, of course, it would be desirable to impound and utilise the surplus, but it is also certain that the construction of such a reservoir as that under consideration and the impounding in it of water on anything like the scale proposed by Mysore would at times seriously affect the irrigation in British territory dependent on the Kistna and on the Tungabhadra below the infall of the Vedavati.

4. It seems, therefore, inevitable that Madras should object to the construction of the reservoir unless provision be made for passing on through it of all discharge down the Vedavati when the water in Tungabhadra is below the crest of the Sunkasala anikat, or that in the Kistna is less than 3 feet above crest of the Bezwada anicut which is the level required to give a full supply to the delta.

5. A table showing the number of days in each month during the last ten years on which the water at the Bezwada anikat was less than 3 feet over the crest is appended.

CHEPAUK,
17*th March* 1892.

G. T. WALCH,
Chief Engineer for Irrigation.

To—The Joint Secretary to Government, Public Works Department (Irrigation).

Enclosure.

Statement showing number of days water was less than 3 feet over crest of Kistna anicut.

Years	January	February	March	April	May	June	July	August	September	October	November	December	Remarks
	2	3	4	5	6	7	8	9	10	11	12	13	14
1882	31	28	31	30	31	10	4	1	2	16	16	23	Crest of anicut raised 1 foot.
1883	31	28	31	30	31	21	3	...	...	...	19	29	
1884	31	29	31	30	31	30	13	...	...	12	25	29	
1885	32	28	31	30	31	30	5	...	1	...	19	15	
1886	31	28	31	30	31	17	2	...	5	4	17	14	
1887	15	19	31	30	31	21	2	...	...	...	6	...	
1888	3	23	31	30	31	23	5	...	3	15	4	15	
1889	31	28	31	30	31	24	2	...	...	...	20	...	
1890	31	28	31	30	31	27	...	...	5	19	11	15	
1891	31	28	31	30	31	29	15	...	6	11.	30	31	

Letter No. 1715-624-5, dated Bangalore, the 21st May 1892, from C. H. Ravensha, Esq., First Assistant to the Resident in Mysore, to the Secretary to the Government of Mysore, Public Works Department.

I am directed to reply to your letter No. 834-142, dated the 19th February 1892, regarding the Marikanave Reservoir Project.

2. Under rule III of the Rules regarding the restoration and construction of irrigation works in Mysore, a copy of which was furnished to this office with your letter No. 3-1 of the 4th January 1892, the Government of Madras object to the construction of the proposed Marikanave Reservoir, unless arrangements be made by which the whole discharge in the river Vedavati will be passed on through or round the proposed reservoir whenever the water in the Tungabhadra is not up to the crest of the Sunkasala anikat, or whenever there is less than 3 feet depth on the Bezwada (Kistna) anicut.

3. A copy of the note on this subject by the Chief Engineer for Irrigation (No. 58-I., dated 17th March 1892), Madras, is enclosed for the information of the Durbar.

(Departmental Library)
Accession No. 015078
Date

3

Letter dated the 23rd May 1892, from Colonel C. Bowen, R.E., Secretary to the Government of Mysore, Public Works Department.

In the accompanying letter from the Assistant to the Resident is conveyed ıe refusal of the Madras Government to consent to the construction of the great :arikanave Reservoir unless on certain prescribed conditions.

These limitations would, in my opinion, so far affect the irrigation of the wide ea it is proposed to water, as to virtually destroy the usefulness of the project. o build a great dam and to establish below it an extensive system of garden and et cultivation, hampered by such conditions as those proposed, would necessarily sult in disappointment and failure. Under the circumstances, it is evident the heme must be abandoned once for all.

Dewan's orders on Public Works Secretary's Memorandum, dated the 23rd May 1892.

I think there are good grounds for doubting the reasonableness of the proposal ade by Madras requiring Mysore to pass the Vedavati water beyond the proposed servoir, either when the Tungabhadra is below the Sunkasala anicut or the istna less than 3 feet above crest of Bezwada anicut. When Tungabhadra and istna are below these levels, Vedavati carries next to no discharge. Is this not ? Do not our and Madras records prove this? This is an important point which ould be cleared up by reference to our statistics and to statistics, if any, in Mad- s. Stress should be laid upon it.

2. The Marikanave will practically intercept only what admittedly flows use- ssly into the sea during the south-west monsoon, and when the Tungabhadra and istna are low, the Vedavati is dry and can't help them.

3. Another point of importance is to ascertain when the Sunkasala and ezwada anicuts were built up to their present levels, and what were their levels years ago. Prescriptive right on the part of Madras, if any, can only exist with ference to levels of these anicuts as uninterruptedly in force during the past years. This is an important point to dwell upon and get full information about. nder such circumstances I would like to have the draft of a careful reply to go to e Resident at an early date.

I would like the Marikanave to be settled finally once for all.

K. SHESHADRI IYER,
Dewan of Mysore.

5th July 1892.

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tter No. 5436-993, dated Bangalore, the 14th December 1892, from Lt.-Col. D. McNeil Campbell, R.E., Secretary to the Government of Mysore, Public Works Department.

With reference to your letter No. 1715-624-5, dated 21st May 1892, I am ected to request that the Government of Madras may be asked to reconsider eir objection with regard to the construction of the Marikanave Reservoir.

2. It appears from the note by the Chief Engineer for Irrigation, Madras, at there are three systems of channels that he considers would be affected by the posed work :—

(1) The Rampur channel irrigating 888 acres.

(2) The Kurnool-Cuddappah canal taking off from the Sunkasala anicut on Tungabhadra.

(3) The Kistna canals taken off from the anicut at Bezwada on the stna.

3. The first of these is a small work and need not be considered. The third ı be entirely left out of the question for it is absurd to suppose that a river like

the Vedavati with a catchment of 2,075 miles could have any appreciable effect on the Kistna river at the Bezwada anicut, a distance of over 300 miles. It is only necessary, therefore, to consider the second work. The Sunkasala anicut was built in 1861-64 and it was supposed that the irrigation under it would amount to 200,000 acres, but it has never reached anything like this figure, the present wet cultivation being only about 30,000 acres. It is presumed that, when the anicut was built, it was ascertained by observation and calculation that there would be sufficient water available for the irrigation of 200,000 acres but as only 30,000 acres are actually watered, the balance of water available for the other 170,000 acres must be wasted and this is a far greater quantity than will be intercepted by the Marikanave dam. It is therefore evident that the storing of water is in this case an absolute advantage.

4. The drainage area of the Vedavati is 2,075 square miles or only about one-tenth of the total drainage area of the Tungabhadra above the Sunkasala anicut, but about two-third of the run-off from this catchment has already been impounded in nearly 1,000 tanks so that the free catchment area available to supplement the supply in the Tungabhadra is only one-thirtieth of the total catchment area of that river at the Sunkasala anicut.

5. Most of the flood discharge in the Marikanave gorge is obtained from the dry and arid tracts of Kadur, Arsikere and Huliyar and it is well known that, in years of normal rainfall, the Vedavati is seldom or ever in flood till the tanks on its catchment are discharging and this occurs almost invariably only in September or October, but sometimes in November; in bad years many of the tanks do not fill at all (as in 1890-91). The record of the flood observations at the gorge for five years gives an average discharge of 15,115 m.c.ft. which represents a run-off of only 3″ per annum from the whole area of 2,075 square miles.

6. It is also proved from the records of 1862 that two-thirds of the whole discharge through the gorge in the year occurs in October alone and six-sevenths of the total yearly discharge in September and October. This is a most important point, as the Chief Engineer for Irrigation, Madras, considers (paragraph 3 of his memorandum) that the reservoir would at times seriously affect the irrigation in British territory; from this it is evident that he thinks that, when the water in the Tungabhadra is low, the supply would be supplemented by the supply from the Vedavati but he is wrong in this respect as the following will show.

7. From the register of water returns of the Tungabhadra river at the Sunkasala anicut it is found that from 1872 to 1889, or a period of 18 years, the water was only below the crest of anicut in September in two years, once for 8 days in 1882 and once for 10 days in 1889; in October for 21 days in 1882 and one day in 1885. From this it will be seen that for 15 years out of 18, the supply in the Tungabhadra was ample and it will probably be found that in the other three years the Vedavati was dry or nearly so.

8. During the months of the year from December to June when the supply at the Sunkasala anicut is deficient, the Vedavati could afford no help, for, as mentioned above, six-sevenths of the yearly discharge is in September and October.

9. From the foregoing facts it will be seen that the effect of construction of the Marikanave reservoir will be practically to intercept only what water the Chief Engineer, Madras, admits, flows uselessly into the sea during the south-west monsoon and in October, while, when the Kistna and Tungabhadra are low, the reservoir will do no harm, as the Vedavati is dry and could not increase the supply.

10. Enough has been said to show that there can be no possible reason for objecting to the construction of the reservoir on the ground that it would interfere with the water-supply to the wet cultivation in British territory, and there are other and very strong reasons why the project should not be stopped :—

1*st*.—The project was under investigation long before the Sunkasala anicut was built in 1861.

2*nd*.—No objections have been raised when the Government of India were going to carry out the work and ordered the necessary data to be worked up.

3rd.—Large sums of money have been spent under orders of Government of India on establishment and survey for the work.

4th.—A provision against famine in the dry tract commanded is absolutely necessary.

11. It must further be remembered that the reservoir will not absorb all the water available, as the tail water from 50,000 acres of cultivation will pass on lower down.

12. The effect of the Vedavati on Kistna at Bezwada anicut cannot, as before stated, be anything appreciable, but it may be as well to state here that the months when there is best supply in the latter river are July to October inclusive.

13. Another fact that may be mentioned is that the Kistna anicut was in existence before the Sunkasala anicut was projected and yet no objections were made to water for 200,000 acres being taken off at the latter, but objection is now made to the construction of a reservoir to store water for 50,000 acres, even though it is known that the cultivation under the Sunkasala anicut has only reached and will in all probability never exceed 30,000 acres.

14. In conclusion, I am to add that this Government feel confident that the Madras Government will no longer object to the execution of this project, which will be of immense advantage to this Province especially as a protection against famine on account of doubts now shown to be unfounded, as to whether it may affect prejudicially the irrigation of land in British territory.

Letter No. 345-43, dated Bangalore, the 24th January 1894, from Lt.-Col. D. McNeil Campbell, R.E., Secretary to the Government of Mysore, Public Works Department.

By desire of the Durbar, I have the honor to request that you will be so good as to again call the attention of the Madras Government to the subject of the construction of the Marikanave dam.

2. In letter No. 5436-903, dated 14th December 1892, the circumstances of the case were fully represented, and it was clearly shown why it was considered that the construction of the dam could not possibly affect prejudicially the irrigation of lands in British territory and the belief was expressed that the Madras Government would no longer object to the carrying out of a work which will be of immense benefit to a larger tract of country that now periodically suffers from drought.

To this letter no answer has been received, and as the matter is one of the very greatest importance as affecting the interest of the province, several works of utility being held in abeyance pending the settlement of the question, I have to request that the matter may receive the consideration of the Madras Government as soon as possible.

Letter No. 7724-62-85, dated Bangalore, the 24th February 1894, from C. W. Ravenshaw, Esq., First Assistant to the Resident in Mysore, to the Secretary to the Government of Mysore, Public Works Department.

With reference to correspondence ending with your letter No. 345-43, dated the 24th January 1894, I am directed to state that on reconsideration the Government of Madras withdraws its objection to the construction of the proposed Marikanave reservoir in the Mysore State.

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Exhibit My. 12.

ENQUIRY INTO THE QUESTION OF STORAGE OF THE CAUVERY WATERS WITHIN MYSORE TERRITORY.

Reply to Part VIII of the Madras Case.

PART I. THE TRUE INTERPRETATION OF THE AGREEMENT OF 1892.

Legal Aspects.

The controversy has become so complex as to necessitate a clear summary of the real and principal contentions of the parties now requiring consideration at the hands of the Arbitration Committee. The complexity arises not only from the bulkiness of the documents filed by the parties but also from changes of position primarily on the part of Madras, from time to time. References to these changes are necessary as they throw unmistakable light on the nature of some of the contentions still urged by Madras for decision.

2. After much discussion it was conceded by Madras that it would be sufficient to determine the rights of Madras as legally acquired and actually existing in 1910 (Ma. I, paragraph 4), and that they could, under the Agreement of 1892, acquire a right by prescription only to what they have been utilising for *irrigation* in their territory (Ma. I, paragraph 32 and Ma. 14, paragraph 12).

3. The objection urged by Madras that "on the face of it, it is difficult to see what exactly the first issue was intended to cover" (Ma. 7, paragraph 3), no longer subsists as the impression of "indefiniteness" complained of could not survive a better knowledge of the pleadings in the case.

4. Madras took considerable pains to refute the arguments of "permissive user" (Ma. 7, paragraph 15) and of "joint possession" (Ma. 7, paragraph 30). The discussions relating to these have been rightly dropped, as it was pointed out that the arguments were what were advanced prior to the conclusion of the Agreement of 1892, and that they had not now been relied on by Mysore.

5. Madras at first contended that the main question for decision was whether or not Madras were justified under the Agreement of 1892, in refusing their consent to a particular work proposed by Mysore and objected to the form of the issue "what is the extent of the prescriptive rights of Madras" (Ma. 7, paragraph 6). When it was shown that whether as a subordinate or principal question the extent of rights of Madras has to be determined, "as on it depends the answer to the question whether Madras are right in objecting to the construction of the new reservoir" (My. 6, paragraph 8), this needless controversy ceased and the objection aimed by Madras against the issue, 2 (*a*), fell to the ground.

6. Madras disputed the competency of the Arbitrator to devise a method by which the water of the river might be usefully employed by both Madras and Mysore and questioned the suggestion of Mysore that the extent of Madras prescriptive right should be determined also on the basis of "fair and reasonable" occurring in clause 3 of the Agreement of 1892. Madras could see nothing but glaring inconsistency in the contentions of Mysore in regard to these points (Ma. 7, paragraph 7). When Mysore, however, pointed out that the extent of a prescriptive right is a mixed question of fact and law, that the test of "fair and reasonable" should be applied in determining the fact; and that this could be done without any such conflict with law as had been apprehended by Madras (Ma. 7, paragraph 7), the challenge was practically dropped by Madras except to the extent that it was not for the Arbitration Committee to devise a method for enabling both Madras

and Mysore to utilize the river in the best manner (My. 9, paragraph 1 and Ma. 7 paragraph 4). Even this last contention is not repeated in Ma. 14, in which however, exception is taken only to the *notions* of what is fair and reasonable (paragraph 23).

7. The lengthy discussion of legal points in Ma. 7, paragraphs 14, and 16 to 46, were mostly drawn from the doctrines relating to the international law and the law of riparian rights, while the correct basis stipulated in the Agreement of 1892, *viz.*, the law of prescription, was almost entirely disregarded. Attention to this error had to be pointedly drawn by Mysore (My. 6, paragraph 10). Nevertheless, Madras still adhered to their original line of thought and pressed for a detailed notice of the cases quoted by them (*vide* paragraphs 7 and 13 of Ma. 11) Mysore were obliged to again explain the correct position (My. 9, paragraph 4) and to furnish a criticism of the case law relied on by Madras (Appendix Q, My. 9) It is now gratifying to note that Madras concede at least a part of the contention of Mysore, *viz.*, that the principles both of the law of prescription and of the law of easements govern the present dispute. (Ma. 14, paragraph 3.)

8. The points still at variance will now be dwelt upon. For the sake of convenience, they will be discussed as far as possible in the order in which they occur in Ma. 14.

9. Mysore have all along been contending that Section 26 of the Limitation Act, before all others should, as far as possible, govern the present dispute and that the general principles of the laws of prescription and easement should be applied to the case subject to Sections 26 and 27 of the Limitation Act. In paragraph 10, My. 6, it was pointed out that " Sections 26 and 27 of the Limitation Act dealing with the subject of acquisition of easements by prescription have long been in force in Mysore also and there can be little doubt that this fact was in the minds of the framers of the Agreement in question." To this Madras replied that it was immaterial whether the rule of common law prescription or that contained in Sections 26 and 27 applied to the case, though they observed they were unable to agree that Sections 26 and 27 were present to the minds of the parties to the Agreement (Ma. 11, paragraph 5). In regard to this, Mysore explained their position more clearly as follows:—" As Sections 26 and 27 of the Limitation Act or the Indian Statute Law were the only ones in force both in Mysore and Madras at the time of the Agreement, the proper presumption is that they alone were present before the minds of the parties thereto. This view is practically conceded by Madras" (My. 9, paragraph 2). To this, Madras can only return a summary and ineffectual answer, *viz.*, " The question of the particular kind of prescription that the authors had in view deserves no further discussion as it is of little practical significance in the present circumstances " (Ma. 14, paragraph 3). What these circumstances are, is stated neither clearly nor definitely ; and this observation of Madras can be no answer to the oft repeated contention of Mysore. Mysore contend that this point has much practical significance as it explains why 1890 is taken in this case as the starting point of the prescriptive period and why Mysore urge that the enjoyment of any right claimed by Madras should be found, if the right is to prevail, to have continued to within two years of the suit and that, if that cannot be found, the claim must fail (My. 6, paragraph 7 : and Mysore 9, Appendix Q, paragraph 7).

10. The division of the Madras claim into—

(i) the flow required during the period March to May and

(ii) that required during the period June to February

is convenient and intelligible. These claims will be referred to in their order.

11. In regard to the first claim, which may, for the sake of brevity, be styled by the already familiar designation of the hot weather supply, there are two serious errors in the Madras position. It is assumed that an "understanding" has been recorded with reference to this supply in paragraph 78, My. 7 and paragraph 99, Madras, Part VI. Next, it is asserted by Madras that the question of prescription arises chiefly in connection with the second claim noted above, implying thereby that it has no material bearing on the first. In view of the turn which the controversy has taken and also of the stage at which it has arrived, a brief and succinct statement of the facts of such controversy from its very inception appears necessary.

12. The question has passed through five distinct phases so far as Madras are concerned:—First of all, Madras definitely stated on the 15th November 1910 (*vide* paragraph 74 below) that no demand for irrigation existed in Madras in regard to the Cauvery water during the hot weather and thus admitted that the whole flow of the river was available for being impounded by Mysore during such period.

Five variations in the Madras case.

Secondly, in Ma. 3, paragraphs 3 and 4, Madras put forward a claim quite inconsistent with their first position, for not less than 900 cusecs. No details in respect of the claim were specified by Madras.

Thirdly, Madras urged in Ma. 4, paragraphs 3 and 4, their alternative claim to the whole natural flow of the river up to 7 ft. in the absence of 900 cusecs. For the first time Madras alleged that their first position was due to an understanding on their part that Mysore would let down 900 cusecs from their power works at Sivasamudram for the hot weather supply of Madras.

Fourthly, in Ma. 9, paragraph 21, a modified claim was asserted by Madras in this respect. Madras stated that their prescriptive right was equivalent to the whole natural flow *minus* the supply customarily drawn off the channels by Mysore for hot weather irrigation within their own territory. And at the same time, in Ma. 10, paragraph 77, Madras urged that their rights extended not to the whole natural flow of the river, but only to a *limit* flow of L million c. foot per day, L being defined as the amount of flow to be fixed under the second term of reference.

Fifthly, Madras urged the existence of irrigation during the hot weather and contended that their prescriptive right extended to the whole natural flow under conditions prior to the installation of power works at Sivasamudram. Madras relied, for this position, on the supposed admission of Mysore that the first part of their fourth contention noted above was sound (Ma. 12, paragraph 99).

13. Mysore noted the first position of Madras; denied the second and the third; contested and argued the fourth; and partly admitted the fifth contention. Mysore claim that Madras should be asked to adduce satisfactory proof of the circumstances urged by them as supporting their claim to hot weather flow.

Mysore case.

14. The points for determination by the Arbitration Committee in regard to the hot weather supply will accordingly be somewhat as follow:—

Points for determination.

(*a*) Whether hot weather irrigation actually exists in Madras above the Upper Anikat under the Cauvery?

(*b*) If so, has the right to draw off water from the Cauvery matured into a prescriptive right in favor of Madras?

(*c*) What is the extent of such right and what limits of flow should be provided for?

These points, just as the main claim to 7 ft. limit flow over the Cauvery Dam, have to be decided on the basis of the Agreement of 1892 and it is needless to repeat the facts which Madras have to prove to support their present claim.

15. Madras rely on the statement of Mysore "even if the waiver is now withdrawn, they (Madras) are only entitled to the natural flow of the river after the customary Mysore requirements are satisfied." This is understood by Madras to be an admission on the part of Mysore of the Madras fourth claim. Mysore must demur to this in the following circumstances:—

Alleged admission by Mysore of the right of Madras.

(i) Mysore had been given to understand that there was no hot weather irrigation in Madras.

(ii) The corner-stone of the Mysore case has throughout been that the prescriptive right of Madras is not to natural flow of water but to *quantities of water or limits of flow actually used for irrigation.*

(iii) The passage in question must be read along with the others in the same paragraph which summarizes the chief contentions of Mysore in regard to the hot weather supply in a way entirely opposed to the passage relied on by Madras. The paragraph must be read as a whole

and a passage therefrom should not be isolated for fixing a construction thereon which obviously militates against both the preceding and succeeding passages.

Average estimated natural flow" explained.

16. The expression "average estimated natural flow" remains to be commented upon. This expression indicates the reluctance of Mysore, often repeated, to admit any right on the part of Madras to natural flow irrespective of a limit flow required for irrigation. Mysore are quite prepared to recognise in favour of Madras any prescriptive right which they can establish to the hot weather supply. But, as a proof of the several facts necessary to establish such a right would involve delay and protract the proceedings of the Arbitration, Mysore suggested that Madras might be given the benefit of "average estimated natural flow." As this suggestion is unacceptable to Madras, Mysore have no objection whatever to its being disregarded without any prejudice to the merits of the case.

The points at variance between Madras and Mysore will then be the three detailed in paragraph 14 above. Madras will have to adduce satisfactory proofs of the same.

17. The second claim, *viz.*, water required by Madras during the period June to February, will now be considered. The contention of Mysore in regard to the Madras claim to 7 feet flow in the Akhanda Cauvery has been quite simple from the very beginning, *viz.*, that Madras never earned a prescriptive right for purposes of irrigation to such 7 feet flow over the Akhanda Cauvery or even at the Cauvery Dam. For, prior to remodelling, the limit flow required and used for irrigation in Madras was 6 feet or less (My. 6, paragraph 17 and My. 9, paragraph 3).

The next step in the reasoning of the case of Mysore is that, even *assuming for the sake of argument* that Madras had earned a prescriptive right to 7 feet flow over the Akhanda Cauvery prior to the remodelling, it is inadmissible under Section 26 of the Limitation Act, as the enjoyment of the right in that manner has ceased from the date of the remodelling of the anikat. The right asserted underwent both physically and legally a radical change in consequence of the remodelling and also of nature of the user that followed it. A limit flow of 7 feet was thereafter secured in actual practice at the Cauvery Dam *without necessitating at the same time any overflow at the Upper Anikat.*

18. As Madras do not appear to have fully understood the facts underlying the legal contentions of Mysore, it will be necessary to state these facts in a different form as follows:—

Before the remodelling of 1899, the circumstances were:—7 feet flow in the Akhanda Cauvery was not used for irrigation by Madras. Even if it be assumed that 7 feet flow over the Cauvery Dam was so used, the 1 foot flow over the Upper Anikat was not specifically used for irrigation even under the Lower Coleroon System. It was only the consequence of a 7 feet flow in the Akhanda Cauvery so far as the Upper Anikat was concerned.

After the remodelling, the circumstances have been as follow:—7 feet flow at the Cauvery Dam may have been utilised by Madras for some years; but this user has not matured into a prescriptive right owing to the period of user falling short of the legally prescribed one. And there has been no flow of 1 foot at all over the Upper Anikat since the remodelling, whenever 7 feet flow has been secured at the Cauvery Dam. Hence the contention of Mysore that the claim to 1 foot flow over the Upper Anikat is untenable and that it is in fact not in existence, assuming that a right to it was ever acquired either as a prescriptive right or as an easement of necessity.

19. The divisibility or otherwise of the right even before the remodelling depends upon the character of the flow as determined by the works. Even the arrangement then in existence was such as to divide the 7 feet flow, if any, into two parts, *viz.*, 7 feet over the Cauvery Dam and 1 foot over the Upper Anikat. This divisibility was still more emphasized by the remodelling of the works in 1899, as the 1 foot flow over the Upper Anikat was altogether detached from the 7 feet flow over the Cauvery Dam and completely stopped in actual use. Thus Mysore do not admit the Madras claim to an *indivisible* right to limit flow prior to the remodelling and much less afterwards.

20. Thus the statements made by Madras in paragraph 11 are based on certain erroneous assumptions, *viz.* :—

(1) that the 7 feet flow used to be prescriptively enjoyed for irrigation by Madras prior to the remodelling;

(2) that the one foot flow over the Upper Anikat was used for irrigation under the lower Coleroon System ;

(3) that there is no difference between using a flow required *directly* for irrrigation and a flow *indirectly* connected with irrigation; and

(4) that their right to flow was indivisible.

Mysore do not grant any of these assumptions as correct. If they are eliminated as they should be, the contentions advanced in paragraphs 11 and 12 of Ma. 14 fall to the ground. This step, *viz.*, 1 foot flow over the Upper Anikat, is not, in the words of Madras themselves, "necessary to make that last step in the process of irrigation possible."

21. It is difficult to follow the line of reasoning of Madras in this paragraph. Mysore have been uniformly contending that the user itself in this case has been varying in extent. In My. 6, paragraph 18, it was observed "In this case water is used in periodically fluctuating quantities dependent upon the varying flow in the river and the varying needs of irrigation." But this contention has not been satisfactorily met by Madras. It is not denied that Madras are at liberty to extend the area of irrigation within their territory; but they are precluded from claiming in consequence thereof any increase over the prescriptive limit flow, unless a right to such increase has become a prescriptive right under the terms of the Agreement of 1892.

Madras paragraph 14.

22. The discussion in paragraphs 14 and 15 of Madras is somewhat inconsistent with the admission made by Madras at the very inception that it is common ground that the rights of Madras are to be determined as in the year 1910 on the basis of Agreement of 1892. In view of this admission, it is really difficult to understand why exception has been taken to the Mysore proposition that the right of Madras is confined to what can be shown to have been uninterruptedly enjoyed for twenty years since 1890. There is substantially no difference between the statement laid down as common ground and that which is sought to be rebutted. Acquisition of prescriptive rights implies the enjoyment of such rights for a period of time as a condition precedent and Mysore have taken this period to be twenty years under the particular law of prescription applicable to the case, *viz.*, Section 26 of the Limitation Act. As a matter of fact, this notion of twenty years was put forward by Madras themselves in the dicussions, etc., preceding the Agreement of 1892 (*vide* Appendix A. Ma. 11, marginal note No. 2, on page 6). This specific period was also emphasized by the late Sir Sheshadri Iyer in his orders dated the 5th July 1892 on the P. W. Secretary's memorandum, dated the 23rd May 1892, in regard to the Marikanave controversy (*vide* copies of correspondence already produced).

Madras paragraph 15.

23. In this case the word 'suit' referred to in paragraph 16, Ma. 14 must be taken to mean dispute. This contention is supported by the meanings of 'suit' as found in the standard dictionaries; and the argument of Madras, therefore, does not hinder the application of either the provisions of Section 26 to this case or the distinction pointed out by Mysore in regard to the decision in *Commissioner of French Hock V. Hugo*, L. R. 10. App. Cases 336. (*Vide* Ap. Q. My. 9, paragraph 9.)

24. Then, again, Madras ask " And further why should we rely only on 20 years' user *after* 1890." Because, the time when the dispute arose and the provisions of the Agreement read with Section 26 of the Limitation Act, as already explained, constitute 1890 as the starting point for consideration for the purposes of this case. It does not necessarily wipe out all previous rights actually earned by Madras ; but, in order that they should be recognized as actually existing when the dispute arose, the necessary proofs should be adduced by Madras. If the present dispute had arisen in 1891 or 1895 as hypothetically put forward by Madras, and had the agreement been in existence in 1891, the starting point would have been 20 years prior to each of those dates, but not 1890. In paragraph 17 of Ma. 14, Madras fail to note that, under the agreement, the *onus* of proving that the rights claimed by them were both "already acquired" and " actually existing " when the dispute arose, *viz.*, 1910, is on Madras themselves.

25. Coming to the question of the area irrigated being a chief criterion in determining the extent of prescriptive right to use of water for irrigation, Mysore observe that their position has again not been correctly understood. Madras themselves have made several statements in their documents filed before the Arbitration Committee, which serve to impliedly prove the correctness of the view urged by Mysore. Reference to a few of such statements will be made here:—

(i) "on the one hand there is an existing prescriptive right of the *lands* in Madras, over a million acres in area, to receive and enjoy without restriction whatever water they (*i.e.*, *lands*) have heretofore been receiving."....."The whole of this area has an undoubted right to receive the natural flow of the Cauvery" (Ma. 9, paragraph 4). The italics are ours.

(ii) "it has been shown that the then existing state of the works made the passing of the water a necessary condition to the *required irrigation supplies being delivered on Madras lands* (Ma. 9, paragraph 18). The italics are ours.

As a matter of fact, in Ma. 14 itself there occurs the passage, "It is no concern of Mysore how Madras utilise or distribute this quantity within its own limits, so long as it is used for purposes connected with irrigation." One step further will render the contention of Mysore clear. Irrigation of what? It is impossible to think of any irrigation *independently of lands*. And Madras cannot certainly deny that the *amount of irrigation* does constitute a chief criterion in determining the extent of prescriptive right to use of water for irrigation. If so. it logically follows that the acreage irrigated is an important element, for the purpose, as contended by Mysore.

26. It is unnecessary to repeat the arguments of Mysore to the effect that the right, if any, earned to the 1 foot flow over the Upper Anikat must be deemed to have been abandoned or to have ceased with the necessity therefor. It is admitted by Madras that the principles of the law of easements are analogically applicable to the present dispute and therefore it follows that they also apply to the pleas of abandonment and cessation of easement of necessity. Madras have said nothing to invalidate these pleas. It is not admitted by Mysore that Madras ever earned a *prescriptive* right for irrigation to this 1 foot flow and therefore the contention of Mysore that the right to 1 foot flow over the Upper Anikat, if any, ceased with the necessity therefor is not inappropriate, as argued by Madras in Ma. 14, paragraph 21.

27. Exception is also taken by Madras to the expression "non-user" employed in connection with this 1 foot flow. But the objection is groundless; for, ever since the remodelling, the 1 foot flow over the Upper Anikat has been non-existent in its possible former sense. It ceased thereafter to be either a cause or a consequence of the 7 feet flow at Cauvery Dam and it was in fact not available for use as such.

Madras paragraph 22.

28. It is strange to find Madras contending that the opinions of Madras Officers and even of the Arbitration Committee, regarding the extent of the prescriptive rights are of no value in this controversy. Mysore are fully justified in their endeavour to support their case that only 6 feet over the Cauvery Dam was the limit of the enjoyment by Madras, by references to the statements made by Madras Officers themselves and, what is more important still, to the calculations embodied in the records relating to Metur Project. These statements would be perfectly relevant evidence even in any Court of law, tending, as they do, to throw light on the question of the extent of actual user. Nor can it reasonably be contended that the calculations and opinions of responsible Public Works Department Officers, conversant with the actually existing facts, would be far divorced from realities. Mysore have therefore sought to support their case from the best evidence possible in the circumstances. It would indeed be highly anomalous if such materials are sufficient to form correct bases for maturing large irrigation projects of Madras, but insufficient to have any probative value in this controversy.

Madras paragraph 23.

Reply to Part IX of the Madras Case.

PART II.—PRESCRIPTIVE RIGHTS.

Madras paragraph 29.

29. A reference to the papers connected with Marikanave Reservoir will show that a mere flow, as such, was not demanded irrespective of the requirements of the area irrigated. In the Madras Chief Engineer's Note No. 58-1, dated the 17th March 1892, the exact areas dependent upon the river Krishna have been given (*vide* copies of correspondence produced already).

Madras paragraphs 30 to 32.

30. Madras have explained that clause (*b*) of the second issue has nothing to do with prescription but that it raises a different question, *viz.*, what must now be done to conserve the rights of Madras. This is straining the plain and unmistakable meaning of clause (*b*) which is only intended to define the quantity of water (measured at the Upper Anikat) necessary for the extent of prescriptive irrigation determined under clause (*a*). The question "what must *now* be done to conserve the rights" forms clause (*a*) of the third issue.

31. Notwithstanding the explanation now given by Madras, the consideration of areas under the two heads originally proposed by Mysore is not affected and the correct way of considering the claims put forward by Madras, *viz.*, (1) 644 m.c.ft., per day over the Upper Anikat under the old conditions, and (2) 7 feet over the Cauvery Dam, is to analyse and see where the quantity of 644 m.c.ft., could be used as contrasted with the other demand. The mere remodelling of the Upper Anikat cannot change this natural division of the areas served by the respective quantities demanded.

Madras paragraph 33.

32. A statement (Appendix S) is attached showing the area of irrigation in the quinquennial periods from 1880 to 1910 prepared from Appendices XV and XXI of the Madras case. Where the figures are not available for any particular channel for any period, the averages of the available figures are taken. Even with this assumption, the total irrigation is seen to have increased gradually by 17,462 acres from 1880 to 1910. In fact, Madras have admitted that some scattered minor extensions of areas have taken place. The question is whether they are merely due to the greater efficiency in control and distribution of water or whether they are extensions requiring an extra quantity of water.

The description of the channels concerned, as given by Madras in their paragraphs 102 and 103, Ma. 14, indicates that any material portion of the extension could not be due to the former cause; and the original statement of Mysore that the area of irrigation must have increased subsequent to 1890 requiring a greater quantity of water holds good. Such extension cannot therefore be included in the extent or area of prescriptive irrigation.

Madras paragraph 34.

33. In the Madras Government Order No. 400-1, dated the 24th September 1909, quoted in paragraph 25, My. 7, the area under the Vadavar is given as 11,000 acres and that under Veeranam tank as 45,000 acres, making a total of 56,000 acres. When this was increased to 63,000 in paragraph 37, Part II, of the Madras case, while the area under the Vadavar was given practically the same as before, Mysore had to state that the increase in the Veeranam tank required an examination. Now, however, Madras show an increase in the Vadavar area from 11,000 to 17,000. This matter requires therefore verification from the information already called for from the Collectors.

34. Madras state that "it is reasonable and proper to consider and study separately the conditions and requirements of irrigation supply for various tracts irrigated under different limiting conditions," the final conclusion being based on a consideration of all these requirements. This is precisely what Mysore have attempted to put before the Arbitration Committee.

Madras paragraph 36.

The consideration of the three groups of areas separately (namely, above the Upper Anikat, in the delta and under the Coleroon, respectively) becomes therefore necessary and proper.

35. The conclusion that no specific supply is required for the area under the Coleroon, can only be arrived at by a separate consideration of its requirements, as shown in the Mysore case.

Madras paragraph 37.

Requirements of the Cauvery Delta.

36. The division of the flow under three heads as below made by Madras in this paragraph is no doubt natural :—

Madras paragraph 38.

(*a*) water for irrigation of the delta,

(*b*) water for scouring through the under-sluices of the Upper Anikat, and

(*c*) water surplussed over the Upper Anikat.

37. The rules in force after the remodelling distinctly specify that no scouring is to be allowed unless water rises above 7 feet. Those prior to remodelling specifically enjoin that scouring should only commence at a depth of flow not less than 6½ feet. So, at a stage of river represented by the 6 feet limit, there would be no scouring. The admission here attributed to Mysore is therefore denied.

38. The statement of Mr. Larminie has been shown to be quite in agreement with the natural interpretation of the rules of 1882 and its value cannot be disregarded.

Madras paragraph 40.

39. The useful limits cannot change from year to year, nor has the necessity of disposal of floods, by distribution into the Cauvery and the Vennar rivers on the one hand, and the Coleroon on the other, materially changed even after remodelling, although there may be a better control at the Upper Anikat. The function of the Grand Anikat to distribute the large floods between the Cauvery, the Vennar and the Coleroon has not been materially altered.

Madras paragraph 43.

40. Any hydraulic engineer will readily admit that, when a maximum difference of 4½ feet between the front and rear gauges is specified, as the limit consistent with the safety of the regulators, the shutters have to be gradually adjusted to this extreme limit. Instantaneous regulation is not practicable. The very necessary intermediate stages of regulation must mean that greater quantities than the specified limits of the full and ample supply, had to be admitted into the canals. Mysore have already explained (in their paragraph 47 of My. 7) that the intermediate stages of the regulation are all represented by clauses 2, 3, 4 and 5 of the rules of 1888.

Madras paragraph 44.

41. The argument of Madras about the wording of the rules and the gradual opening of the scour gates of the Upper Anikat, would hold good only if the regulating staff employed on the spot were as competent as the framers of the rules. But such rules of regulation are framed to avoid all deficits due to possible mistakes of regulation which must always arise on account of the more or less imperfect appliances and agency employed for the purpose. A very delicate adjustment of the gates would be necessary to keep the level constant with a changing river and this cannot always be expected of the regulating staff. It is therefore natural that an allowance of about 6 inches should have been made in the rules for scouring and another 6 inches for sand in the low stages as already explained.

Madras paragragh 45.

42. That the sluice gates would be kept open discharging as much as 669 m.c.ft., in a falling river and yet water maintained at 6 feet level over the Cauvery Dam, is inconsistent with

Madras paragraphs 48 & 49.

the natural conditions, and is also against the spirit and letter of the rules of 1882, clause 2 in particular.

The natural mode of regulation according to the rules would be that the gates would be begun to be closed as soon as water falls below 6½ feet and would be absolutely shut when 6 feet level is reached. No claim to the water for scouring would thus arise at a stage of flow in the river equal to 1,625 m.c.ft.

If occasional scouring be necessary, Madras have still the full option of utilising whenever they please for scouring or for any other purpose all excess flow and occasions of such excess will not be materially diminished by the Mysore Reservoir, the impounding in which will be practically confined to high stages of the river in July and August.

Madras paragraph 50.

43. It may here be stated that facilities for scouring would be much less with the proposed Metur Reservoir, as its capacity is much larger, while the quantity of water diverted for other than scouring purposes is nearly 5 times the quantity proposed to be utilised through the Mysore Reservoir. Floods below the Mysore Reservoir and unintercepted by it, are more abundant and occur more often than below the Metur Reservoir and yet no specific allowance is made for scouring in this Project.

44. Whatever may be the value of the figure for discharge given by Major Oakes, the level of the Calingula crest should be taken as fixed. It discharges when there is a flow of 5½ feet above the Cauvery Dam, as given by Madras; and this does not necessitate any change in the Mysore statement (My. 7, paragraph 44).

Madras paragraph 52.

45. The argument here is practically a repetition of the contentions in paragraphs 43 and 44 which have been answered above.

Madras paragraph 53.

The existence of facilities for forcing extra water after remodelling is admitted by Madras. This practice being of recent origin cannot create any prescriptive right. There will be plenty of surplus water left at the option of Madras even after the Mysore Reservoir comes into operation; and with the means of control now obtainable at the Upper Anikat, Madras will be at liberty to take this water into their canals if they choose. This matter will be more fully dealt with in the later paragraphs.

46. The argument here has been answered in the reply to paragraph 44 *supra*. The figures given in the Madras Appendix XVIII are not based on any specific requisitions for extra supplies of water required and cannot therefore be accepted in the light of the explanation given by Mysore.

Madras paragraph 54.

47. Clause 1 of the rules of 1902 relating to non-flood season is reproduced below for ready reference :—

Madras paragraph 55.

> "On Monday and Tuesday full supply will be sent down the Cauvery and what surplus there is will be sent down the Vennar. On Wednesday and Thursday full supply will be sent down the Vennar and what surplus there is will be sent down the Cauvery. On Friday, Saturday and Sunday, the water will be sent down the Vennar and the Cauvery proportionately."

Here distribution by turns and proportionate distribution are mentioned on specific days of the week and the position taken by Madras that distribution by turns is not enjoined in the rules, is obviously wrong.

48. Even taking the somewhat higher figures derived from the Assessor's curves and accepting allowances made for losses in transmission, the argument of Mysore still holds good, *viz.*, that 6 feet must have been the full supply limit prior to remodelling, considering that facilities have been afforded for forcing extra supplies after remodelling.

Madras paragraph 56.

49. With the explanation given above in paragraphs 39 and 40, there is nothing to add in reply to the Madras contention here, except to refer to the statement of one of the responsible Madras officers quoted under :—

Madras paragraphs 57 & 58.

> "No scheme for the complete exclusion from the delta proper below the

Grand Anikat of all the Cauvery floods, except what is required for irrigation is either practicable or advisable." (*Vide* item, para 35 of Ma. 16.)

Madras paragraphs 59 & 60.

50. An attempt has been made here by Madras to show that by means of dam stones the gauge reading of the Cauvery branch could be raised from 4·67 to 6·67 feet. The quantity represented by this higher gauge would be about 30,000 cusecs; and, as this is much more than what Madras are now claiming for the whole of the irrigation under both the Cauvery and the Vennar, *viz.*, 26,680 cusecs, the conclusion is obvious that, if such a quantity had been admitted into the river Cauvery alone, it could not have been all for purposes of irrigation, in the face of the specific full and ample supply of 11,240 cusecs for the Cauvery branch, noted in the rules.

Madras paragraph 63.

51. Notwithstanding the contentions here, the conclusions to be drawn from Mysore Appendix D and mentioned in paragraph 49, My. 9 require no alteration.

Madras paragraph 64.

52. The computation made by Mysore was only a modification of the Madras computation after making some allowance for the continuous flow in the hot weather due to power works. But, if *twenty times* the figure computed by Mysore (20 × 583 m.c.ft., = 11,660 m.c.ft.,) would still be found by Madras quite inadequate to fill up the sandy beds of the delta rivers and channels as now asserted by them, then the Metur Project supply for the month of June (354 m.c.ft. × 30 = 10,620 m.c.ft.) would be much more inadequate for that purpose. There would only be a *minus* discharge left for the fields. It is significant that the pertinent reference made by Mysore to a passage in the Metur Project in this connection, has also been entirely ignored by Madras. All that Mysore urge is that the limit for June cannot be the same as for July and August, and whatever limits may be fixed for these latter months, the limit for June may be reasonably reduced in the proportion of the quantities connoted by the gauge readings 2·9 and 6·1 (354 : 1,690), these being the Metur Project limits for June and July. Thus, with the limit flow of 1,625 m.c.ft., proposed by Mysore for July and August, the flow due in June would be about one-fifth of 1,625 or 325 m.c.ft. But Mysore have already made a more liberal allowance by fixing limits of 450 m.c.ft. and 1,045 m.c.ft. for the first and second half of the month, respectively.

Madras paragraph 68.

53. Sir John Benton's tables in Appendix II give the total quantities due to discharges up to a limit of 7 feet at the Cauvery Dam from day to day. They have no reference to the total discharges that would result from the "full and ample supply" limits mentioned in the rules of the Grand Anikat. This is what was meant by Mysore when they stated that Sir John Benton's inferences were drawn without reference to the prescribed rules of regulation.

Madras paragraphs 69 & 70.

54. The matter that is said to be irrelevant has been put in by Mysore to show that the conditions of even the worst year would not be disturbed by the proposed impounding. The impounding is confined mostly to July and August, when generally the floods are abundant and so the area of transplantation will not be affected by it. The north-east monsoon conditions are practically undisturbed by the reservoir.

Madras paragraphs 71 & 72.

55. The corrected figures in column 7 of Appendix XXIV, Ma. 14, are not exclusive of the large quantities of tail water wasting into the sea. This is so stated in the Madras Printed Reports. The discharges are necessarily high due to the admission of excessive quantities for disposal of floods and so they do not give an idea of the correct requirements of irrigation. Such an idea can only be obtained from the figures in column 10. A comparison of these with the figures in column 5, which are the quantities resulting from the Mysore limits, shows that the legitimate requirements of irrigation will be met, as already explained in paragraph 61, My. 9.

56. Here it may be noted that the losses in transmission and draw-off between the Upper and the Grand Anikats were not considered by Mysore, as these will be generally made up by the replenishment from the Kodumuruti river with a catchment area of 768 square miles which joins the Cauvery above the Grand Anikat.

57. It is admitted that rice crop irrigation necessarily means some waste due to the change of stagnant water. But, in the delta, the drainage channels of the upper areas act as supply channels for the lower areas and so the wastage on this account is not much. The full and ample supply limits according to the rules provide for all such necessary change of water. But the total discharges shown in column 7 of Madras Appendix XXIV, include extra quantities let in merely for the disposal of floods. The Madras Triennial Report for 1901-02, therefore, states that the omission to deduct such extra flood water gives " a wholly false idea of the quantity of water used." If the explanation of Madras now given, that all quantities passed into the Cauvery and the Vennar are to be considered useful, were correct, the words "wholly false idea of the quantity of water used" would not have been used in an important Government Report.

Madras paragraphs 73 & 74.

58. The words "it is well known that the maximum requirements of rice crop is represented by a total depth of 72 inches of water above the fields," used by Mysore in their paragraph 62, My. 9, require some explanation. The practice in Mysore in computing *tank storage* required for rice cultivation is to take a depth of 72 inches over the fields to be irrigated, inculding provision for evaporation and absorption in the tank; and this quantity required per acre is generally known as a *unit* in Mysore. Thus, the quantity represented by 72 inches depth "above the fields " is that required at the head of the canal system.

Madras paragraphs 76 & 77.

59. The total quantity of water required for 890,000 acres of single crop area and 90,000 acres of double crop area with 66·05 and 49·45 inches, respectively, comes to 181,000 m.c.ft., and not to 190,000 m.c.ft., as stated by Madras. Assuming that this would be the requirement in a normal year for the delta area, the quantities due to the Mysore limits, as shown in column 5 (of Madras Appendix XXIV) are in most cases greater than this figure. In bad years, there is a deficiency in the river flow itself, and it is natural that the resulting flow would be somewhat less. But a glance at column 5 will show that even this variation is not much.

60. It may be here stated that, although the figures in column 5 are those due to the strict application of the rules, Madras will have the option, during the period of impounding, of taking larger supplies as they please. The difference between the normal supply of 181,000 m.c.ft., noted above and the figures appearing in a few cases in column 5, would then be more than made up. Hence, even on the considerations put forward by Madras, there will be ample supply to meet all the legitimate requirements of the delta after impounding in Mysore.

61. A reperusal of paragraph 65, My. 9, and paragraph 63, My. 7, will show that Madras should not demand very high limits of flow with a view to avoid granting remissions in bad years which they have been granting in the past.

Madras paragraph 78.

62. While Mysore admit a 6-feet limit flow in the height of the south-west monsoon season, they have been from the very commencement urging that the same limit would not be applicable throughout the irrigation season.

Madras paragraphs 79 & 80.

63. Madras have admitted that substantial reduction of canal supply is possible on account of rainfall and that concession might be given to Mysore in this respect. To secure this concession it is now to be decided whether the rules suggested by Mysore may not be adopted bodily, or with such modifications as may be necessary.

Madras paragraph 82.

Coleroon Requirements.

64. The sources of supply to the Coleroon system are correctly stated by Madras. As the extensive and deep sand bed of this river acts as a reservoir to hold the run-off from the large catchment of 1,077 square miles, this water would be available for irrigation at the Lower Anikat. Taking the average rainfall as 35 inches, a run-off of 12 m.c.ft. per square mile can be safely expected and this will mean an yield of 12,924 m.c.ft., capable of irrigating about 45,000 acres.

Madras paragraphs 87 & 88.

Also, the floods in the worst year (1899) after impounding in Mysore, amount to about 49,000 m.c.ft., at the Cauvery Dam as can be seen from the working tables appended (Appendix T). It may be expected that by direct flow into the Veeranam tank and the canals, and by absorption into, and subsequent seepage from, the bed of the river, about one-fourth of this surplus may be expected to be utilized for irrigation. This also means about 45,000 acres. The Veeranam tank catchment has been shown to irrigate about 30,000 acres (My. 7, paragraph 72).

Thus, the total area that can be irrigated from the local rainfall and the floods alone will amount to 45,000+45,000+30,000=120,000 acres, which is more than the total area of irrigation dependent on the Coleroon system.

But the above calculation does not include the very large amount of leakage from the delta rice lands flowing directly into the Coleroon. This alone would suffice for about 30,000 acres of irrigation. Thus, all the four sources would yield sufficient water for an area of about 150,000 acres.

65. At all events, there can be no difficulty whatever in securing enough water even in bad years, for the 112,000 acres under the Lower Anikat, without imposing any additional burden on Mysore specifically for this area. These details fully explain the passage already quoted (and now repeated for ready reference) from the Metur Reservoir Project.

"It is found as a fact, that although no definite supply through works is being passed into the Coleroon, there is always an adequate supply in that river for the Lower Anikat system when the supplies in the Cauvery system are adequate."

66. The object with which the tables in Appendices K & K-1 have been prepared will be explained more fully now.

The quantities actually diverted for irrigation into the different canals (column 10) are in most cases less than the quantities shown as due to leakage, seepage, etc. (column 8). Sixteen fortnights are considered in each year. Of these, there are only 4, 0, 4, 2 fortnights in the years 1899-00, 1904-05, 1905-06, 1906-07 respectively, when the actual quantity used for irrigation (column 10) is greater than the quantity due to "leakage, etc." (column 8). Thus, the periods when the flow from the surplus works above was helpful in adding to the discharge in the canals, cannot but be considered *rare*. Madras, instead of comparing figures in columns 8 and 10 as shown above, have by mistake compared columns 6 and 10 and it is natural that their conclusion should be wrong.

67. What Mysore meant when they said that the flow in the Lower Anikat canals has been "maintained," will be clear from the above. All that they meant was that the flow in the canals, *such as it was*, was practically all obtained from "leakage, etc.," and that the surplus water from works above contributed to such flow only on rare occasions.

The words "leakage, etc.," have been used in the heading of column 8 to denote that the additions are not merely from leakage, but also from all other sources, such as seepage arising from absorption from floods of both the monsoons. No object could have been gained by showing the *minus* figures in this column. What is clearly intended is that there is an arithmetical increase in column 7 over column 6 on many days. And the quantity of such increase, being unaccounted for by direct flow, can only be considered as due to leakage, seepage, etc. That there is absorption also of large quantities between the surplus works and the Lower Anikat is not denied. That such absorption partly accounts for the additions shown in column 8 has been admitted by Madras also.

In fact, it is this absorption whether from the floods or from the leakage water flowing into the Coleroon from the rice fields or from direct run-off from the catchment, that must fully account for the flow at the Lower Anikat when there is more than the direct supply from the surplus works above. If this is understood, there can be no vitiation of figures in column 8 in the omission of the *minus* quantities, which merely mean absorption of one sort or other noted above. It is true that for the moment the appearance of the *minus* figure really means the absorption of so much water into the bed of the Coleroon. This absorption does not at the same time mean that the water so disappearing is permanently lost. Madras have themselves stated that the bed of the

river acts as a reservoir to store up such absorbed water and this is always returned in the low stages of the river to maintain the flow at the Lower Anikat, *such as it is*. This absorption appears again as a positive gain and accounts for the total quantities of leakage, etc., shown in column 8; and so the figures given in paragraph 78, My. 9, do not require any modification and cannot be considered as either erroneous or misleading.

For example, referring to Appendix K-1, in the month of July 1899 the total quantity surplussed as per column 6 is 25,058 m.c.ft. The observed discharge at the Lower Anikat is 21,759 m.c.ft. . The inference is natural that (25,058—21,759-) 3,299 m.c.ft., had all disappeared by absorption. But the figures shown in column 8 indicate that a total of 1,725 m.c.ft. has actually reappeared as an additional discharge due to seepage from the absorption of 3,299 m.c.ft., noted above. Similar remarks apply to other months also.

68. Now, coming to the supply of the Veeranam tank, column 11, Appendix K-1, shows the total discharge passed through the Vadavar; and this in every case is less than the quantities of leakage, etc., shown in column 8 and indicates that whatever supply was passed through the Vadavar for direct irrigation as well as for replenishment of Veeranam tank was practically all derived from other than direct flow.

69. Provision for direct irrigation on the Vadavar has been taken at a duty of 50 acres. The quantity corresponding to this duty or whatever less quantity was available, has been assumed as having been used for direct irrigation on the Vadavar.

The balance quantity, as shown in column 13, is what is left for the Veeranam tank, either for "impounding" or for direct irrigation thereon. The quantities in column 13 by themselves would be insufficient to meet the requirements of the irrigation under the Veeranam tank, which, however, has been successfully carried on from year to year. The conclusion is therefore inevitable that the help which the Veeranam tank cultivation gets from the Vadavar is quite insignificant, the major portion of the supply being doubtless derived from its own catchment. With this explanation, the Mysore argument in paragraph 75, My. 7, *viz.*, that the irrigation under the tank does not materially depend upon the south-west monsoon supply from the Coleroon, stands good. Madras in Ma. 1 have specifically made a very limited demand of only 66 m.c.ft., for this purpose, corroborating the above view. Even this demand of 66 m.c.ft. will appear excessive from the actual average daily discharges shown in column 14 (Appendix K).

70. If, as implied in sub-paragraph 6, under paragraph 89, Ma. 14, the impounding in the Veeranam tank can only commence when the total discharge in the Vadavar exceeds 110 m.c.ft., then, for the four years for which the tables are prepared (Appendix K. and K-1), there would have been no scope whatever for such impounding in any of the years except for four days in 1906 (24th to 26th July and 29th August) and the quantity available on these four days was 1 to 5 m.c.ft., only. This is in spite of the fact that there was abundant flow at the Lower Anikat on many days as may be seen from column 7. Thus, no such specific flow as is now demanded was taken in past years nor is it really required.

71. Madras themselves have admitted in paragraph 98 that the effect of the Mysore Reservoir in a good year will not injure the Lower Anikat irrigation. But even in the worst year, 1899, the available surplus after impounding in the Mysore Reservoir will be 49,000 m.c.ft., at the Cauvery Dam (Appendix T).

Madras paragraphs 95 to 98.

It has been admitted by Madras that the discharges in high floods at the Cauvery Dam are under-estimated. If a correct estimate be made, the quantity now given as 49,000 m.c.ft., would really mean much more. Thus, there is no reason to apprehend that, even in the worst year, the Mysore Reservoir will reduce the floods in any way prejudicial to the Lower Anikat irrigation. It is in this sense that Mysore stated in paragraph 84, My. 9, that the correct measurement of high floods had an important bearing on the Mysore Reservoir, on the one hand and on the requirements of Coleroon irrigation, on the other.

An abstract (Appendix W) of discharges of the Lower Anikat showing the figures for the two monsoon seasons separately, has been extracted from the annual diagrams furnished by Madras. It will be seen that in the worst year (1899) as

much as 55,000 m.c.ft. was uselessly surplussed into the sea at the Lower Anikat; and the Mysore Reservoir would only intercept a portion of this large wastage. The argument holds with greater force in other years as the surplusses were much larger.

Hot Weather Flow.

72. As there has been some misapprehension in this matter, the claim to hot weather flow has been dealt with under its legal aspects in paragraphs 11 to 16 *supra*. The facts, however, have been briefly summarised here.

Madras paragraph 99.

Madras have stated (paragraphs 3 and 4, Ma. 4) that they would waive their claim to the hot weather flow provided the power water of 900 cusecs was guaranteed; if this was denied, they claimed *the whole natural flow of the river up to the limit of 7 feet*, as in the irrigation season. Mysore could not be sure that their power works would continue as they are or that the quantity would not be reduced on account of any improvements or any additional power installations lower down the river. They therefore wished to reserve to themselves the option to modify the quantity of water used, according to the demand for electric power, or according to their convenience. They therefore urged that while the natural flow had been known to go so low as 90 cusecs, Madras could not reasonably claim a constant flow of 900 cusecs.

73. The expression "the natural flow" was used by Mysore in this connection in paragraph 78, My. 7. But this was taken by Madras as the "whole natural flow" in paragraph 99, Ma. 12. It is clear that, in so converting the expression, Madras could not not go beyond the claim already twice made by themselves in unmistakable terms, first, in paragraphs 3 and 4, Part II, Ma. 4, where *the whole flow up to 7 feet limit* was claimed and again, in paragraph 77 of Part IV (Ma. 10), where the flow up to L million cubic feet is claimed, L being defined as "the limit amount of flow due to Madras as fixed under the second term of reference." Thus, the expression, the "whole natural flow," must be subjected to some limit to be fixed now.

74. In paragraph 2 of a Note, dated 15th November 1910, by the Superintending Engineer, on special duty, which accompanied D. O. letter R. O. C. 386-1-10, dated the 6th December 1910, from the Joint Secretary to the Government of Madras, Public Works Department (Irrigation), to the Hon'ble the Resident in Mysore, Madras has stated that, in the months of March to May, "there is no demand for irrigation water." Therefore, such a limit flow would have been practically *nil*. The original statement was, however, subsequently modified by Madras to the effect that there was some hot weather irrigation on the upper channels. Mysore, in consideration of all this, stated in their paragraph 88, My. 9, that the claim of Madras would be respected up to the average estimated flow after meeting the customary requirements of Mysore.

75. Madras have now furnished figures showing the area of hot weather irrigation. The area of such irrigation in the year 1890 was 27,324 acres under second crop and 3,232 under perennial crops, making a total of 30,556 acres. This total increased to 35,450 in the year 1900 before the introduction of power works. But, in the year 1910, the total had further risen to 46,224 acres, the latter increase being presumably due to the constant flow from power works in recent years. It is not clear whether the second crop requires water during the whole of the hot weather from February to end of May, for the natural hot weather flow, known to go down to 90 cusecs, would certainly be not sufficient for this large area. It is therefore necessary to determine when the second crop supply ceases, and after this period what limit flow is necessary for the perennial crop in the lowest stages of the river. In fact, two limits will be necessary in the hot weather (from February to May) one for the second crop period including the perennial crop and the other for the latter crop only. In consideration of all this, reasonable limits have now to be fixed under clause 2 of the terms of reference. If, on account of any cause, the power water falls below 900 cusecs, Madras rights up to these limits will be respected.

CAUVERY CHANNELS ABOVE THE UPPER ANIKAT.

76. It was always understood that the requirements of these upper channels would be adequately and automatically met by the stages of the river flow corresponding to the limits fixed for the delta irrigation.

On several previous occasions, the construction of reservoirs on the Bhavani and the Cauvery above the upper channels, have been carefully and seriously considered by competent and eminent engineers who had a thorough knowledge of the requirements of both the delta and the upper channels.

77. Mr. Hughes in proposing the Bhavani project fixed a standard of 4½ feet for the supply of the delta and seriously recommended that all supplies above this could be impounded, without any harm to the delta irrigation. It is true that, so far as can be judged from the records supplied to Mysore, he has not made any specific reference to the requirements of the upper channels. But it is impossible to believe that such an experienced officer could have ignored the requirements of these channels. The inference therefore is that Mr. Hughes considered that the upper channels would not in any way suffer with the standard depth of 4½ feet proposed by him for the Cauvery delta.

78. Madras now represent that the stages of the river between 3½ and 5½ feet at the Cauvery Dam would mean a time of scarcity for these channels. This may be so when compared with the higher stages of the river. But, except in July and August, the stage of the river is generally between these limits. The irrigation under these channels is dependent on the direct flow in the river without anikats or headworks. As such, a more or less continuous flow only can ensure irrigation under them. The limit of irrigation would therefore be determined by the stages of the river between 3½ and 5½ feet; a condition which can be depended on practically throughout the irrigation season. Mr. Hughes, when he fixed the 4½ feet standard for the Cauvery Dam, must have been influenced by this view.

79. Mr. Larminie, who differed from Mr. Hughes, proposed a limit flow of 6 feet at the Cauvery Dam, above which impounding in the proposed Cauvery Reservoir might be allowed in the south-west monsoon.

Colonel Smart was practically of the same opinion as regards the 6 feet limit. If, as now stated by Madras, 7 to 7½ feet stage of the river is necessary for the upper channels, surely, the two former Chief Engineers named above would not have proposed the cutting off of all flow above the 6 feet limit.

80. The Metur Project also contemplates the cutting off of the river flow to nearly the same limit of 6 feet, as noted above, in the height of the south-west monsoon (July 6·1, August 5·9). But, if the provision made in the Metur Project from September to November is considered, the conclusion is inevitable that the supplies to the upper channels would be strictly limited to what could be obtained by the stages of flow as under:—

	1st half.	2nd half.
September	... 5·6	4·7
October	... 5·0	4·2
November	... 3·8	3·8

If the representation now made by Madras is to be accepted, that the stages of flow between 3½ feet and 5½ feet at the Cauvery Dam would mean times of scarcity for these channels and that no replenishment is possible without freshes into them, then surely the interests of these channels must suffer with the Metur Reservoir in operation, as practically all freshes would be arrested by it.

Hence, it is clear that the cultivation on the upper channels is limited by these lower stages of the river flow.

Madras have stated in paragraph 107, Ma. 14, that these channels receive adequate supply at a stage of flow of 6 feet. Mysore have already proposed a limit of 6 feet in July, August, and first half of September, when at all such a limit can be expected, the limits from September to November being between 4·5 and 5·4 feet. The working tables have clearly shown that, in these latter months, there is scarcely any impounding and the interference with the natural flow will be practically *nil*.

81. Madras admit that it is not possible to give exact figures to connect the stage of flow at the Upper Anikat with the stages at the different points of offtake

up the river. In the face of this, the mere statement that it is believed that stages of flow under 7 feet involve material reduction of useful supply, cannot have much value. For, in another place, they have distinctly admitted that these channels begin to receive adequate supply at a stage of flow represented by 6 feet. The latter statement is definite and tallies with the opinion of experienced engineers named above. It is therefore clear that a consideration of the requirements of these upper channels will not necessitate the fixing of any higher limits than those proposed by Mysore.

Reply to Part X of Madras Case.

PART III—PLACE AND MODE OF MEASUREMENT.

82. Notwithstanding what has been stated in these paragraphs, the necessity for conducting further observations extending over a longer period to arrive at more reliable results, cannot be denied. Madras have in a way admitted that they have no objection to this course. Arrangements may therefore be made to institute these observations for ascertaining the factors (*a*), (*b*), (*c*), (*d*) and (*e*) mentioned in paragraph 91, My. 8.

Madras paragraphs 107 to 110.

83. The conditions (i) and (ii) specified by Sir John Benton and referred to by Madras are the very conditions to settle which the Arbitration Committee are now sitting. After such settlement, the claim of Mysore would be precisely what Sir John Benton has conceded, *viz.*, "that the Mysore Durbar are to have all the surplus supplies to which they have any claim under the existing agreement placed unconditionally at their disposal."

Madras paragraphs 111 and 112.

84. In these and some subsequent paragraphs, Madras have repeatedly raised an important point about extending their irrigation and have attempted to mix up such future contingencies with the present enquiry. This is quite inadmissible as the scope of the Arbitration is confined to the question of the Mysore Reservoir and its effect on the existing prescriptive Madras irrigation. It is understood that the Arbitration Committee will not be moved by any such considerations of future expansion in giving their decision. In this connection, a reference is invited to paragraphs 101 and 102, My. 9.

85. Madras object to the system of measurement proposed by Mysore, now for the first time on the ground that it would concede to Mysore rights to the flow of the Bhavani, the Amaravathi and all the basin of the Cauvery beyond Mysore. It should be remembered that the prescriptive rights of Madras can only be settled with reference to the quantity of flow at the Cauvery Dam which, from the nature of things, include the flow from both the Mysore and Madras areas. The settlement of such a right imposes a burden on Mysore only to the extent by which the flow of the Madras area falls short of the prescriptive requirements. This is clearly the basis of the Agreement of 1892. Accordingly, Mysore have all the while been claiming that whatever surplus there may be at the Cauvery Dam over and above the prescriptive limits, should be placed at their disposal up to the extent available in their territory. This is all their Table III aims at. It is therefore difficult to see how Madras can maintain their contention that Mysore would get a claim to the waters of the Bhavani or any other tributary of the Cauvery in Madras by the system of measurement proposed by Mysore.

86. The necessary provision for the existing prescriptive irrigation without reference to future extensions, will no doubt be decided on all "fair and reasonable" considerations, as provided in the Agreement of 1892. It is urged that, if the method proposed by Mysore is shown not to materially affect the existing prescriptive irrigation in Madras, it should be accepted. What constitutes material interference with the quantity and the incidence of flow is a matter for decision on a consideration of all the circumstances of the case.

Madras paragraphs 113 and 114.

87. In settling prescriptive rights, the most important point to consider is up to what extent it is obligatory on the part of Mysore to contribute to the flow necessary for the existing Madras irrigation. All excess flow above such obligatory limits will

Madras paragraphs 115 and 116.

e at the disposal of Mysore and any quantity which they do not or cannot impound ;ill be available at the Cauvery Dam for use, within certain limits. It would be mpossible under any reasonable system of rules to impound in a reservoir without ome interference with the quantity or incidence of flow. When Madras raise an)bjection against such a system on account of inevitable small differences, the ques- ion will be whether the available excess flow at the Cauvery Dam cannot reasonably)e expected to make up for such deficits, when the excess flow follows immediately fter the periods of these deficits. If, on all fair considerations, this excess flow an be found to so compensate for the deficits, there can be no proper grounds for)bjecting to the mode of measurement proposed by Mysore. It is to bring out this iew prominently that Mysore have shown what may be conveniently termed ' useful surplus " as available at the option of Madras.

88. But Madras represent that these deficits, very insignificant as they are, vill mean that—

(*a*) in a good year the average out-turn of crop per acre would be reduced, and

(*b*) in a bad year the reduction would entail probable failure more or less complete to an area several times larger than that stated as the area equivalent to the deficiency.

If the " useful surplus " noted above be utilised, Mysore are confident that the ibove unfavourable contingencies would never happen and the result would if anything be quite in favour of the Mysore method of measurement.

89. All that Mysore have to say in reply to the matter in these paragraphs has already been stated in their paragraphs 106 to 119 of My. 9. The spirit of the remarks therein made ias evidently not been fully appreciated by Madras who are obviously aiming at ibsolute non-disturbance both in the incidence and the quantity of natural flow ip to the fixed limits. No reservoir would be possible without some disturbance. [f this position is not recognized, it is tantamount to a repudiation of the Agreement)f 1892.

Madras paragraphs 117 to 122.

90. Mysore do not deny that there will be trifling disturbances due to their methods of impounding. But they have amply shown that these disturbances are of a very minor nature and that they are more than made up by the immediately succeeding abundant flow which, if properly utilised, as by all reasonable considera- tions Madras will be expected to, and as a matter of fact they will no doubt, do, the slight disturbances which are complained of, will not cause any injury to the standing crops.

91. As so much is made of a few days of *minus* flow and compensation water, it is desirable to examine the question a little more in detail. Revised working tables on the basis of dates corresponding to the flow at the Cauvery Dam with 4 days as the time of transit, have now been prepared for the year 1899 and extracts from these for the days of impounding are appended (Ap. T).

92. It will be seen that there are only two days, on which a *minus* flow has occurred in the year 1899 out of the 34 days when at all any impounding could be done in the whole period of 214 days. On both the occasions, *viz.*, 14th June and 10th August, the river at the Cauvery Dam was at its ebb, the discharges being 803 m. c.ft., and 200 m. c.ft., respectively. On both occasions there was sudden rise on the succeeding days, up to 5,103 m. c.ft., and 1,877 m. c.ft. The *minus* flow on both occasions is shown by the tables as a result of an incorrect estimate of the time of transit. It may be true that such mistakes are inevitable, but the effect of such *minus* discharges have been immediately afterwards more than remedied by the abundant rise in the river up to the high limits named above.

93. It is also urged that these *minus* figures mean the deprivation of so much water from the legitimate supply of the upper channels. Let us sup- pose that a stage of river of 1 foot on the Cauvery Dam represents the level of zero supply to the upper channels. The falling of the river *below this 1 foot* cannot affect the upper channels any more than the falling down *to 1 ft. level*, as in both these stages the flow into the channels would be represented by zero. So, in judging the effect of a *minus* figure, the difference of flow into the channels, between the natural flow stage before impounding on the day the *minus* figure appears, and the zero stage, is all that can be considered as a loss to the channels.

94. On the two occasions, on which *minus* figures occur in the year 1899, the stages of the river at the Cauvery Dam are denoted by gauge readings 4·6 and 2·0, respectively. The corresponding discharges on these two days are 803 m. c.ft. and 200 m. c.ft., respectively. The value of the *minus* figures on these dates are 377 and 1,194. The Madras contention appears to be that the loss to the upper canals cannot be less than *377* and *1,194*. By this they imply that the loss to the upper canals will be equal to or more than the above figures. This is evidently a fallacy. If the supply to these canals before impounding was, say, 100 m.c.ft. and 30 m.c.ft., respectively, on these days, it is impossible to conceive how the loss to them will be represented by the full value of the *minus* figures, in this instance 377 and 1,194 m. c.ft., respectively. The fact is that the canals cannot lose more than the actual flow therein on these days, namely, 100 and 30 m. c.ft., respectively.

95. In fact, taking the maximum area of irrigation under these channels as 100,000 acres, the quantity of water required for these at a duty of 40, will be 2,500 cusecs or about 220 m. c.ft. From the preceding paragraph, it will be clear that whatever be the value of the *minus* figure, the maximum loss on any particular day that can be caused to the upper canals cannot exceed this quantity of 220 m. c.ft. If this is remembered, the contention of Madras about the loss to the upper canals cannot but appear to be exaggerated. These *minus* quantities have occurred in the month of June, when irrigation will not have been started and when the purpose of wetting the canal beds and the fields served by the first floods can be equally well done a day or two later. The second instance occurring in August is at a very low stage of the river represented by 2 feet and this too is more than made up by the succeeding high discharges.

96. Although, arguing on general principles, the *minus* quantities are shown to be of much consequence by Madras, the examination of the particular cases in the worst year, considered above, has clearly shown, first, that the disturbance to the upper cannals, if any, is much less than would be apparently represented by the *minus* figures, 2ndly, that the defects, such as they are, are made up on the immediately succeeding days in each case, and 3rdly, as irrigation will not have been started in the period in which such *minus* figures generally appear, there can be no room for complaint of any sort.

97. Having shown that the appearance of *minus* discharges in the tables are not of much consequence in actual practice, the conditions under which the compensation water becomes due and the effects thereof may now be discussed, with reference to the working tables for the year 1899, the worst on record.

98. It will be observed from column 6, that there are only 6 days on which compensation becomes due in the total period of 4 months, June to September.

Out of this, the first is on the 14th of June which is due to a *minus* flow. This is immediately followed by an abundant flow of 3,130 m.c.ft. and above, which is kept on successively for 4 or 5 days. On the 28th of June, a small quantity of compensation water of 103 m. c.ft., becomes due. This is also succeeded by abundant floods which amply make up for it.

In August, there are 3 days on which compensation water becomes due. But a glance under column 7 from the 14th to the 16th, will show that, on all the 3 days, this water has materially increased the flow in the river when it was low. The balancing effect in a falling river is materially helpful to Madras at a time when it is most required.

On the 13th September, compensation water of only 67 m. c.ft. becomes due and this is with a rising river and so its effect would be insignificant.

Thus, out of 6 days noted above, the effect of compensation water is insignificant on two days. It is substantially useful on three of the other days both to the delta and to the upper channels as it increases the natural flow in a falling river.

99. It is true that part of the compensation water results in producing a surplus over the Mysore limits as shown in column 9. But, from column 8, it will be seen that very large quantities of water above the limits are at the disposal of Madras on almost every day of impounding. In fact, impounding is done only on 32 days in the whole period of 122 days considered. Out of these 32 days, on as many as 26 days, abundant quantities of surplus are available as shown in column 8

and they are at the full disposal of Madras and may be used by them for scour, or for Coleroon irrigation or for any other purposes they may choose.

100. So the necessity of passing compensation water, as such, could not be taken as any grave defect in the system of measurement or as in any way materially interfering with the incidence and quantity of flow necessary for Madras irrigation.

It must be remembered that the year 1899 was the worst on record. The results with the adoption of the Mysore method, have thus been proved by the working tables to be satisfactory even in such a year ; in ensuring the interests of Madras unimpaired, it is hardly necessary to examine similar details for other years, as Madras themselves have admitted that, in good years, the effect of the reservoir will not be prejudicial to their interests.

101. Apart from the objection on the ground of future development of irrigation, which, as stated above, is outside the scope of this enquiry, the only other point that Madras have urged against the Mysore method is that it "cannot give a basis on which the natural flow can be computed" at the Upper Anikat.

Ma. paragraphs 123 and 124.

The exact method by which the flow at the Cauvery Dam can be computed, has been clearly described under clause 5 of Ap. E., My. 7, a reference to which is again requested. Madras have accepted the method so far as the computations go, but have now referred to two factors which, in their opinion, would tend to vitiate the above computation.

102. As regards one of these factors, *viz.*, R, the possible deficit to the upper channels, Mysore have already shown that the real interests thereof do not suffer either by the *minus* flow or by the necessity of providing compensation water and that the slight deficits, if any, are more than made up by more or less abundant flow in the immediately succeeding days, as shown by a study of the working tables (Appendix T).

103. As regards the other factor S, namely, the inflow due to seepage from the bed and sides of a falling river, which in the opinion of Madras tends to increase the flow at the Cauvery Dam and consequently lessens the burden on Mysore, several counter-considerations suggest themselves.

104. It cannot be denied that this seepage inflow is a natural addition to the river, more or less similar to the additions from any of the tributaries below the Kannambadi Dam. If Madras object to credit being given to this source of contribution in measuring the flow at the Cauvery Dam, is it also to be inferred that similar objections apply to the flow from the other rivers, both in Mysore and Madras territories below the reservoir? The proposition put in this light clearly shows that the Madras position is untenable.

On the other hand, Mysore with equal force can urge that, in a rising river, when generally impounding is done, the natural flow would be correspondingly under-estimated by the extra quantity of flow which would be absorbed into the bed and sides of the river. This is generally more than the seepage quantity received back in the low stages of the river. To this extent Mysore would suffer owing to the reduction of the quantity permissible for storage and increase in the quantity of compensation water. If the inflow factor S is to be counted in favour of Madras in low stages, is not a corresponding factor S+X to be counted in favour of Mysore in the immediately succeeding high stages? The factor S brought in by Madras therefore does not need any further notice.

105. This also leads to another important consideration regarding the condition of flow in the river that will obtain after the Mysore Reservoir is built and after the irrigation under it comes into full operation. It is well known that, under any system of irrigation, a good portion of the water thrown on the fields flows back directly or indirectly into the river. This is generally estimated at about one-fourth to one-sixth of the quantity thrown on the fields. Mysore proposes to utilise about 40,000 m. c.ft., on their fields below the reservoir. Of this, about 8,000 m. c.ft. of water would be flowing back into the river.

106. It is hardly necessary to quote any instances to prove this fact. The recently constructed Marikanave Reservoir is across the river Vedavati or Huggari,

flowing near Bellary. This river used to be practically dry for nearly 9 months in the year prior to the construction of the reservoir; and now the same has been converted into a perennial stream, as any inhabitant of the Madras Districts bordering on the river can testify. This is partly due to the direct in-flow from the fields and partly to the increase in springs owing to the high level of the water stored in the reservoir.

107. There is every reason to expect that such contribution to the river flow by the existence of the Kannambadi Reservoir would be very material. The only way by which Mysore can get credit for at least a part of this additional contribution into the river, is by the method of measurement proposed by them. In fact, for the majority of the days in the irrigation season, Mysore will not get credit for this flow (even by their method) as the total even with its addition would be less than the prescribed limits. So, this indirect flow will be a positive gain to Madras, not to speak of the power water flowing constantly in the hot weather.

108. If Madras object to this method on the score of the two factors R and S which have been shown above to be insignificant or ineffective, Mysore will be more than fully justified in claiming a proper account at least of all the indirect contribution to the river flow due to their reservoir. It is here that fair and reasonable considerations have to come in for a proper decision of the case. Mysore trust that the method of measurement proposed by them will be accepted, because it is the only method that will not prove unfair to Mysore, while at the same time adequately safeguarding the interests of existing irrigation in Madras.

Ex. My. 12.

Appendix S.

Statement shewing the area irrigated by the channels and tanks fed by the Cauvery and its tributaries above the Upper Anikat.

River	Tributary or Channel	1880	1885	1890	1895	1900	1905	1910	Remarks
Tirumanimuthar	.....	*6036**	*6036**	*6036**	6069	6324	5244	6506	* Average of 4 years
Omalur River ...	.....	*5049**	*5049**	*5049**	5467	5113	3453	6164	* Do
Thoppiyar ...	.....	*2**	*2**	1	1	1	3	3	* Average of 5 years.
Sanathkumara-nadi.	.....	234	249	233	240	229	232	243	
	Total ...	*11321**	*11336**	*11319**	11777	11667	8932	12916	* Increase from 1880 to 1910 is 1,595 acres.
Bhavani ...	Thadapalli and Kalingarayan channels.	*30043**	*30043**	29264	29446	30007	30414	31085	* Average of 5 years.
	Other channels ...	*2276**	*2276**	1922	2115	2362	2376	2605	* Do
	Total ...	*32319**	*32319**	31186	31561	32369	32790	33690	* Increase from 1880 to 1910 is 1,371 acres.
Noyel ...	.....	*15414**	*15414**	15515	14554	15733	15437	15833	* Average of 5 years.
	Total ...	15414	15414	15515	14554	15733	15437	15833	Increase from 1880 to 1910 is 419 acres.
Amaravathi ...	22 channels ...	*26116**	*26116**	*26116**	20068	26066	25889	26441	* Average of 4 years.
	4 channels ...	*2584**	*2584**	2777	2521	2526	2528	2568	* Average of 5 years.
	Nanganjiyar ...	*782**	*782**	604	669	922	682	1035	* Do
	Shunmuganadi ...	*5957**	*5957**	5054	5064	6099	5926	6177	* This is the area for the year 1884.
	Poranthalar ...	851	927	971	940	967	981	970	
	Pachiyar ...	*1540**	*1540**	1689	1674	1385	1446	1609	* This is the area for 1884;
	Nallathangayar ...	*262**	*262**	254	269	263	256	270	* Average for 5 years.
	Varathar ...	*1918**	*1918**	2161	2064	1686	1524	2157	* Do
	Other channels 10 in number.	*4616**	*4616**	3784	4455	4776	4722	5342	* Do
	Total ...	44626	44702	43410	43524	44690	43954	46569	Increase from 1880 to 1910 is 1943.
Cauvery ...	Pogalore ... Vangal ... Nerur ...	*4980**	*4980**	*4980**	5020	4923	5014	4965	* Average of 4 years.
	4 channels in Kulittalai Taluk.	7881	8849	10144	9983	10175	10408	10440	
	3 channels in Namakkal Taluk.	5215	5329	5252	5251	5250	5260	5446	
	8 channels in Musiri Taluk	12318	13826	10062	12459	12773	14742	15189	
	5 channels in Trichi Taluk	57005	56534	61073	62234	62845	63028	63493	
	Total ...	87399	89518	91511	94947	95966	98452	99533	Increase from 1880 to 1910 is 12,134.

Abstract.

No.	Name of channels and rivers	Total increase	Remarks
		Acres	
1	Minor channels	1595	
2	Bhavani	1371	
3	Noyel	419	
4	Amaravathi	1943	
5	Cauvery	12134	
	Total ...	17462	

Appendix T.

Extract from Table III.

Month and date	Approximations for quantity to be impounded (2) a: Y = Flow at Kannambadi in m. c. ft.	b: NY = Probable flow at Cauvery Dam N = 2/3 from June to September N = 3 from October to January	c: NY-Z = Probable excess over the limit at Cauvery Dam Z = Limit in Col. 16.	d: NY-Z/o = Value of Col. 2 (c) at Kannambadi Dam, i.e., 1/3 of Col. 2 (c)	e: Quantity to be impounded at Kannambadi Dam. Col. 2 (d) or 2 (a) whichever is less	Conditions of the Cauvery Dam 3: Flow at the Cauvery Dam in m. c. ft. 4 days later	4: Value of Col. 2 (c) at Cauvery Dam = 1/3 of Col. 2 (c)	5: Net flow at Cauvery Dam, Col. 3 − Col. 4 + 1/3 of surplus at Kannambadi, if any	6: Compensation water, Col. 9, if less than Z or Z − col. 5. Z = limit in Col. 16	7: Resulting flow at Cauvery Dam, Col. 5 + Col. 6, 4 days previous	8: Surplus quantity above the limit at Cauvery Dam	9: Quantity in excess of limit out of compensation water	Conditions at the Kannambadi Dam 10: Gross storage in the reservoir, Col. 2 (e) + previous day's balance in Col. 15	11: Compensation water converted to Kannambadi Reservoir, i.e., 1/3 of Col. 6	12: Draw-off for irrigation, etc.	13: Surplus when the reservoir is full	14: Total of columns 11, 12 and 13	15: Balance in the reservoir	16: Limit of flow allowed at Cauvery Dam	17: Remarks
	*		*		*		*		*		*		*		*			*			
June 1899. 13	336	538	...	...	...	696	...	696	...	696	...	...	9484	...	...	...	43	9441		
14	1573	2517	1457	1943	1573	803	1180	−377	1180	−377	...	...	11014	...	...	...	43	10971		
15	2631	4210	3150	4200	2631	5103	1973	3130	...	3130	2680	...	15602	...	...	...	43	13559		
16	3182	5091	4031	5375	3182	6042	2387	3655	...	3655	2595	...	16741	...	152	...	152	16589		
17	3520	5632	4572	6096	3520	6534	2640	3894	...	3894	2834	...	20109	...	152	...	152	19957		
18	4042	6447	5407	7209	4042	5198	3032	2166	...	3346	2286	1180	23999	1573	152	...	1725	22274	1060	
19	2495	3992	2932	3909	2495	3439	1871	1568	...	1568	503	...	24769	...	...	...	152	24617		
20	1350	2160	1100	1467	1350	2295	1013	1282	...	1282	222	...	25967	...	...	...	152	25815		
21	936	1498	438	584	584	1639	438	1201	...	1201	141	...	26399	...	...	...	152	26247		
22	513	...	...	...	...	1180	...	1180	...	1180	120	...	...	...	...	...	152	...		
23	378	...	...	...	...	946	...	946	...	946	...	...	...	...	...	...	152	...		
	*		*		*		*		*		*		*		*		*			
	27	542	...	...	...	...	516	...	516	...	516	...	...	...	...	...	...	152	25335		
	28	1080	1728	103	137	137	538	103	435	103	435	...	...	25472	...	..	...	152	23320	1625	
	29	1486	2378	753	1004	1004	2573	753	1820	...	1820	195	...	26342	...	...	...	152	26172		
	30	2192	3507	1882	2509	2192	5388	1644	3744	...	3744	2119	...	28364	...	...	...	152	28212		
July 1899.	1	2798	4477	2852	3803	2798	6321	2099	4222	...	4222	2597	...	31010	...	...	...	...	30854		
	2	3006	4810	3185	4247	3006	5855	2253	3602	...	3705	2080	103	33860	...	156	...	293	33567		
	3	2702	4323	2698	3597	2702	5621	2027	3594	...	3594	1969	...	36269	137	156	...	...	36113		
	4	2482	3971	2346	3128	2482	4921	1862	4078	...	4078	2453	...	38595	...	156	1359	...	37080		
	5	2269	3630	2005	2673	2265	3946	1699	3829	...	3829	2204	...	...	...	...	2109	...	...		
	6	2025	3240	1615	2153	2025	3182	1519	3065	...	3065	1445	...	...	...	...	1869	...	...		
	7	1435	2296	671	895	895	2573	671	2456	...	2456	831	...	...	...	...	739	...	...		
	8	1099	1758	133	177	177	2295	133	2178	...	2178	553	...	...	...	...	21	...	...	1625	
	9	1311	2098	473	631	631	2853	473	2736	...	2736	1111	...	...	...	...	475	...	...		
	10	2094	3350	1725	2300	2094	3564	1571	3447	...	3447	1522	...	...	...	...	1938	...	...		
	11	2156	3450	1825	2433	2156	2853	1617	2736	...	2736	1111	...	...	...	...	2000	...	...		
	12	1547	2475	850	1133	1133	2490	850	2373	...	2373	748	...	...	...	...	977	...	...		
	13	1172	1875	250	333	333	1997	250	1880	...	1880	255	...	...	...	...	177	...	37080		
	14	995	...	...	...	...	1587	...	1587	...	1587	...	...	...	...	...	...	...	...		
	*		*		*		*		*		*		*		*		*			
August 1899.	9	650	...	...	...	...	200	...	200	...	200	...	...	...	...	...	...	...	32868		
	10	1887	3019	1394	1859	1859	200	1394	−1194	1394	−1194	...	...	34727	...	...	...	156	34571		
	11	1673	2677	1052	1403	1403	1877	1052	825	800	825	...	...	35974	...	...	...	156	35818		
	12	1262	2019	394	525	525	1407	394	1013	394	1013	...	...	36343	...	...	...	156	36187		
	13	776	...	...	...	...	1116	...	1116	...	1116	...	...	36187	...	...	...	156	36031	1625	
	14	619	...	...	...	...	1008	...	1008	...	2402	777	777	...	1859	156	...	2015	34016		
	15	447	...	...	...	...	851	...	851	...	1651	26	26	...	1067	156	...	1223	32793		
	16	457	...	...	...	...	706	...	706	...	1100	...	...	...	525	156	...	681	32112		
	17	457	...	...	...	...	696	...	696	...	696	...	...	...	...	...	...	...	...		
	*		*		*		*		*		*		*		*		*			
September 1899.	12	528	...	...	...	...	1008	...	1008	...	1008	...	...	...	...	...	...	...	27900		
	13	742	1187	67	89	89	954	67	887	67	887	...	...	27989	...	156	...	...	27833		
	14	356	...	...	...	...	1008	...	...	...	1008	...	...	...	...	...	...	...	...		
	*		*		*		*		*		*		*		*		*			
	16	722	1155	35	47	47	4340	35	4305	...	4305	3185	...	27568	...	156	...	...	27412	1120	
	17	1168	1869	749	999	999	2713	749	1964	...	2031	911	67	28411	89	156	...	1245	28166		
	18	1201	1922	802	1069	1069	3182	802	2380	...	2380	1260	..	29235	...	156	...	...	29079		
	19	971	1554	434	579	579	3755	434	3321	...	3321	2201	...	29658	...	156	...	...	29502		
	20	562	...	...	...	...	2179	...	2179	...	2179	1059	...	...	...	...	...	...	29346		
	*		*		*		*		*		*		*		*		*			
Totals to end of December	99377	...	...	...	51977	201552	...	...	3938	175254	49341	2153	...	5250	...	11664	...	...			

Net quantity impounded = col. 2 (c) col. 11 − col. 13 = 35063.

Appendix W.

Abstract of discharges at the Lower Anikat.

Years	S. W. monsoon June to September		N. E. monsoon October to January		Totals of S. W. and N. E. monsoons		Grand Total of South-West and North-East monsoons	Remarks
	Irrigation supply	Surplus into sea	Irrigation supply	Surplus into sea	Irrigation supply	Surplus into sea		
1	2	3	4	5	6	7	8	9
1890-91	10524	58006	10744	48909	21268	106915	128183	
1891-92	...	...	...	...	...	...	....	Figures not available.
1892-93	15745	165512	7952	4474	23697	169986	193683	
1893-94	12100	35175	11943	105420	24043	140595	164638	
1894-95	11527	58873	9643	10818	21170	69691	90861	
1895-96	15326	121257	13101	64888	28427	186145	214572	
1896-97	21859	376061	12471	32943	34330	409004	443334	
1897-98	20514	994270	12313	77856	32827	1072126	1104953	
1898-99	10051	53026	10667	162459	20718	215485	236203	
1899-00	7058	50410	4043	5364	11101	55774	66875	
1900-01	17878	319595	8134	15863	26012	335458	361470	
1901-02	14104	99593	11053	91439	25157	191032	216189	
1902-03	9997	86656	6998	147404	16995	234060	251055	
1903-04	13610	230936	15923	310790	29533	541726	571259	
1904-05	13412	166138	6713	5884	20125	172022	192147	
1905-06	...	...	...	...	...	...	...	Figures not available.
1906-07	...	...	...	...	...	...	...	
1907-08	...	...	...	...	...	...	...	
1908-09	12499	130466	7971	34389	20470	164855	185325	
1909-10	14345	380625	10854	63405	25199	444030	469229	

Exhibit Ma. 18.

Cauvery channels above the Upper Anicut.

These channels are supplied by direct flow from the Cauvery river without the intervention of anicuts and the incidence of supply is fluctuating and in accordance with the fluctuations of the levels of water in the river opposite the points of off-take incidental to natural flow.

The limits of natural flow required to give full useful supply to these channels have only now been made the matter of investigation and the conditions of supply to these channels have been only described in any detail in the Madras case, Part IX, paragraphs 100 to 105 (Ma. 14).

It is here stated that, during the season of freshes, the stage of river giving full supply to these channels is that generally denoting a stage at the Upper Anicut of gauge reading 7 to 7½ feet, Cauvery Dam, with the Upper Anicut shutters closed.

Further, that levels above 8 feet on Cauvery Dam were not useful and that reduction of levels below 7 feet involved reduction in useful supply to these channels.

2. Regular daily gauge readings are only available for some of the channels, *viz.*—

	ACS.
Pugalore channel	2,400
Marudur Nattu voikal	6,500
Wyyacondan channel	26,000
Musiri Nattu voikal	2,600
Nangam channel	2,300
Amoor channel	800
Thottiem Peria voikal	1,200
Do. Chinna voikal...	4,000

Item (1) is the only channel above the confluence of the Amaravati for which regular gauge readings are available.

Items (2) and (3) are the two most important channels below the confluence of the Amaravati. The gauge readings and conditions of irrigation of these have been considered. They have all head sluices and under ordinary circumstances the full supplies carried, when the water levels in the main river permit, are—

	Head sluice rear gauge.	Discharge cusecs.
Pugalore	5 feet.	...
Marudur	4·7 „	168
Wyyacondan	5·6 „	765

The above statement can be verified from the record of daily gauge readings of these channels.

3. In order to get the stage of river at the Upper Anicut which generally agrees with the conditions of full supply to these channels, diagrams have been drawn showing, for days in which the Upper Anicut was closed and the Cauvery Dam gauge read between 4 and 7½ feet, what were the front gauge readings of the channel head sluices corresponding to the gauge at Cauvery Dam. From these diagrams an approximate relation between the gauges is obtained. The diagrams have been drawn for the months of June, July, August, as the relation is less subject to disturbance by local rain during this period than during other months.

The minimum front gauge to give the required full supply rear gauge are approximately—

	FEET.
Pugalore	5·15
Marudur	4·9
Wyyacondan	5·75

The diagrams show that the corresponding Cauvery Dam gauge heights are—

	FEET.
For Pugalore channel	6 to 6½
„ Marudur „	6¾ to 7½
„ Wyyacondan channel	6½ to 7¾

For the last two channels, a reading of 7 feet will generally give full supply, but this is not always so.

4. It is claimed that facts now stated supported by the diagrams and record of gauge readings substantiate the statements of Ma. 14, paragraph 104, that 7 to 7½ feet on the Cauvery Dam connotes the stage of river giving full supply to the Madras Cauvery channels taking off above the Upper Anicut.

W. M. ELLIS, COL., R.E.,
Madras Representative.

Exhibit Ma. 19.

With reference to Madras (Ma. 14), Appendix XXII, a table is now produced as requested by the Assessor showing the resulting combined discharges of the Cauvery and Vennar regulators as shown in Sir J. Benton's note of 12th May 1911, Appendix V, column 10, and the discharges now obtained on method explained in Appendix XXII and the discharges recorded in the Madras Annual river diagrams.

Years	As reproduced from column 10, Appendix V, of Sir J. Benton's note of 12th May 1911	Re-calculated as per method Appendix XXII, Ma. 14	Discharges recorded in the Madras Annual river diagrams
1	2	3	4
	M.C.FT.	M.C.FT.	M.C.FT.
1896-1897	227,560	301,825	303,985
1897-1898	205,990	295,076	296,520
1898-1899	173,508	230,297	231,375
1899-1900	117,312	123,924	123,980
1900-1901	229,671	334,076	336,330
1901-1902	204,624	274,609	276,126
1902-1903	173,109	218,492	219,688
1903-1904	223,146	284,707	285,380
1904-1905	128,933	190,929	192,050
1905-1906	165,265	186,306	187,208
1906-1907	185,701	199,991	201,268

The average daily discharge figures reproduced from Madras Administration Reports in Sir J. Benton's note of 12th May 1911, Appendix V, column 5, were found by adding the average daily discharge for each month, June to November, and dividing by 6, instead of taking the whole discharge for the period and dividing by 183, and similarly for period, December to March. This gives a small error and to this is due the small differences in columns 3 and 4.

W. M. ELLIS, COL., R.E.,
Madras Representative.

1

Exhibit Ma. 20.

Remissions—Delta System in the delta irrigated area, Tanjore district.

In accordance with the wishes of the Arbitrator, enquiries have been made regarding the yearly record of remissions due to deficiency of supplies of water given in the Cauvery delta in the twenty years, 1890 to 1909. Further, as directed, enquiry was made as regards the losses which are due to poor outturn of crop attributable to deficient supply in the same period.

2. As regards remissions, these are only granted in the case of irrigated crops where total failure of crop occurs or when owing to failure in the supply of water to the area no crop has been put in. The records of remissions are kept not by systems but by taluks. In the figures produced, the Collector of Tanjore has omitted the amounts of remissions in the non-deltaic taluks (Pattukkottai and half Tanjore). These are deducted from the totals of the district to get the remissions in the delta. The records of remissions show the reasons for remissions under three heads, *viz.*—

(i) withered crop, that is, failure of planted crop due to deficient supply.
(ii) submergence and other causes producing failure of planted crop.
(iii) waste or unplanted areas.

Item (iii) is sub-divided by the Collector in a separate statement into—

(*a*) Lands left waste owing to deficient water.
(*b*) Do do submergence.

This statement is appended as Table I. Table II shows total areas of remissions on the delta lands of Tanjore district due to deficiency of water which includes items (i) and (iii) (*a*) above and remissions due to submergence and floods, items (ii) and (iii) (*b*).

3. It has to be noted that the area of the Coleroon Lower Anicut system, south of the Coleroon, which form part of the Tanjore district delta lands, are included in these figures.

4. The resulting total shows remissions of revenue in twenty years of Rs. 4,44,104 for deficient supply and Rs. 3,24,741 for submergence.

It is brought to notice that in 1899 the loss due to submergence, Rs. 2,82,205, was to a great extent, really, although indirectly, due to deficient supply, as explained in Madras, Part IX, paragraph 66 (Ma. 14), and had the year been a normal one except for the floods of the second-half of October, the total remissions due to submergence would not have been great. The figures given for the above paragraph, Ma. 14, require some revision as the original figures given by the Collector are reported by that officer after further scrutiny to be inaccurate. The differences now shown are not very material and the Jamabandi report of 1899-1900 now attached fully supports the explanation of the losses given in the Madras case.

5. There is no direct record of the losses incurred by short outturn of crop, but there is record of the estimated yearly outturn of paddy crop from 1901 to 1910 under the headings shown in the attached table III which is furnished by the Collector of Tanjore.

This officer suggests that the losses of ryots due to deficient water-supply may be estimated as under the following assumptions:—

(1) that, if supplies of water are adequate and suitable in the delta, it is a fair assumption that the yield will be a-12 anna one at least. If they do not yield this, they have either been damaged by deficient supply or by submergence.

(2) that 30 *kalams* per acre is assumed as the equivalent of a-12 anna crop.

(3) that the value of paddy during the period 1901 to 1910 is Rs. 1-8-0 per *kalam*. This is put forward as a fair valuation.

(4) that the average yield of crops recorded to yield between 8 and 11 annas is 10 annas,
between 4 and 7 annas is 5 annas.
„ 0 „ 3 „ 2 „

Table IV shows the resulting yearly loss of paddy in *kalams*.

6. The total losses to *ryots* yearly for deficient supply is computed on the above assumptions taking the proportion which the loss due to deficient supply bears to the whole loss as the same as the proportion of remission for the year due to deficient supply bears to the whole remission.

7. The resulting table of losses to ryots due to deficient supply (Table V, col. 6-a) shows loss in the ten years from 1901 totalling to 402 lakhs and averaging, say, 40 lakhs yearly. Losses due to floods come to 244 lakhs in the same period.

8. The method of computation is, however, likely to exaggerate the latter figure as losses due to submergence are to a considerable extent total losses and if the crop is not totally destroyed, it is frequently not badly injured by submergence. This, however, does not hold in the case of losses due to deficient supply and considerable losses from this cause may be suffered in a year in which no considerable remission is granted. This point is emphasized in the Jamabandi report of the year 1890, a year of low supply but also of small remission.

9. The Collector's annual Jamabandi reports attached to this note give further details regarding the yearly conditions of supply and attention is especially invited to these.

W. M. ELLIS, COL., R.E.,
Madras Representative.

Table I showing remissions for waste on account of deficiency of water and floods, Tanjore district.

Fasli	Years	Waste			Remarks
		Owing to deficiency of water	Owing to floods	Total of columns 3 and 4	
1	2	3	4	5	6
		Rs.	Rs.	Rs.	
1300	1890—91	1,516	...	1,516	
1301	1891—92	7,884	...	7,884	
1302	1892—93	134	...	134	
1303	1893—94	...	...	...	
1304	1894—95	2,530	...	2,530	
1305	1895—96	1,866	...	1,866	
1306	1896—97	1,486	...	1,486	
1307	1897—98	1,350	...	1,350	
1308	1898—99	...	6,426	6,426	
1309	1899—00	1,69,933	...	1,69,933	
1310	1900—01	1,170	...	1,170	
1311	1901—02	820	...	820	
1312	1902—03	...	1,243	1,243	
1313	1903—04	...	10,092	10,092	
1314	1904—05	12,659	...	12,659	
1315	1905—06	1,113	...	1,113	
1316	1906—07	203	...	203	
1317	1907—08	51	...	51	
1318	1908—09	7,328	...	7,328	
1319	1909—10	3,381	...	3,381	

3

Table II showing the total remission for each fasli from 1300 to 1319 in the deltaic parts on account of deficiency of water and floods, Tanjore district.

Fasli	Year	Due to deficiency of water	Due to floods	Total of columns 3 and 4
1	2	3	4	5
		Rs.	Rs.	Rs.
1300	1890—91	2,330	306	2,636
1301	1891—92	11,169	2,131	14,100
1302	1892—93	14,699	15	14,714
1303	1893—94	1,631	5,789	7,420
1304	1894—95	5,952	913	6,865
1305	1895—96	1,866	311	2,177
1306	1896—97	1,486	1,184	2,670
1307	1897—98	3,850	1,487	5,337
1308	1898—99	2,639	32,826	35,464
1309	1899—00	2,93,779	2,20,002	5,13,781
Total ...		3,40,201	2,64,963	6,05,164
1310	1900—01	3,317	1,718	5,035
1311	1901—02	871	...	871
1312	1902—03	132	4,440	4,581
1313	1903—04	1,019	20,451	21,470
1314	1904—05	35,026	1,760	36,786
1315	1905—06	1,777	28	1,805
1316	1906—07	26,023	15,549	41,572
1317	1907—08	559	698	1,257
1318	1908—09	17,847	9,936	27,783
1319	1909—10	17,332	5,189	22,521
Total ...		1,03,903	59,778	1,63,681
Grand Total ...		4,44,104	3,24,741	7,68,845

TABLE III.

Year	Fasli	13 to 16 annas	12 annas	8 to 11 annas	4 to 7 annas	0 to 3 annas	Total
1	2	3	4	5	6	7	8
		Acs.	Acs.	Acs.	Acs.	Acs.	Acs.
1900—1901	1310	69,071	443,951	278,812	30,391	824	823,049
1901—1902	1311	81,558	510,400	286,539	44,886	2,587	925,970
1902—1903	1312	32,008	342,567	444,580	101,823	5,538	926,516
1903—1904	1313	18,774	358,839	447,113	87,169	10,859	922,754
1904—1905	1314	69,071	94,231	386,323	162,678	72,426	784,749
1905—1906	1315	9,525	273,894	452,755	95,208	90,034	921,416
1906—1907	1316	15,341	268,141	431,856	163,727	39,626	918,691
1907—1908	1317	8,359	324,559	485,498	91,580	18,247	928,243
1908—1909	1318	4,069	159,161	477,101	243,583	37,412	921,326
1909—1910	1319	10,704	723,132	33,275	7,057	2,669	776,837
Total ...		318,480	3,498,895	3,723,852	1,028,102	280,222	8,849,551

TABLE IV.

Year	Ten annas	Loss in *kalams*	Five annas	Loss in *kalams*	Two annas	Loss in *kalams*	Total loss in *kalams*—cols. 3, 5 and 7
1	2	3	4	5	6	7	8
1901	278,800	1,394,000	30,400	53,200	820	20,500	1,467,700
1902	286,540	1,432,700	44,900	785,750	2,590	64,750	2,283,200
1903	444,580	2,222,900	101,820	1,781,550	5,540	138,500	4,142,950
1904	447,110	2,235,550	87,170	1,525,475	10,860	271,500	4,032,525
1905	386,320	1,931,600	162,680	2,846,900	72,430	1,810,750	6,589,250
1906	452,750	2,263,750	95,200	1,666,000	90,030	2,250,750	6,180,500
1907	431,860	2,159,300	163,720	2,865,100	39,620	990,500	6,114,900
1908	485,500	2,427,500	91,580	1,602,650	18,250	456,250	4,486,400
1909	477,100	2,385,500	243,580	4,267,900	37,400	935,000	7,588,400
1910	33,270	166,350	7,050	123,375	2,670	66,750	356,475
Total ...	...	...	...	...	...	...	43,242,300
Average for ten years	...	...	...	...	...	...	4,324,230

TABLE V.

Fasli	Year	Loss in *kalams* as per table IV	Total loss value at Rs. 1—8—0 per *kalam*	Remission as per table II	
				Due to deficiency of water	Due to floods
1	2	3	4	5	
			Rs.	Rs.	Rs.
				(a)	(b)
1310	1900—1901	1,467,700	22,01,550	3,317	1,718
1311	1901—1902	2,283,200	34,24,800	871	...
1312	1902—1903	4,142,950	62,14,425	132	4,449
1313	1903—1904	4,032,525	60,48,788	1,019	20,451
1314	1904—1905	6,589,250	98,83,875	35,026	1,760
1315	1905—1906	6,180,500	92,70,750	1,777	28
1316	1906—1907	6,114,900	91,72,350	26,023	15,549
1317	1907—1908	4,486,400	67,29,600	559	698
1318	1908—1909	7,588,400	1,13,82,600	17,847	9,936
1319	1909—1910	356,475	5,34,712	17,332	5,189
Total ...	...	43,242,300	6,48,63,450	1,03,903	59,778

Fasli	Year	Total loss		Total net loss	
		Due to deficiency of water	Due to floods	6 (a)—5 (a) due to deficiency of water	6 (b)—5 (b) due to floods
		6		7	
		Rs.	Rs.	Rs.	Rs.
		(a)	(b)	(a)	(b)
1310	1900—1901	14,50,355	7,51,195	14,47,038	7,49,477
1311	1901—1902	34,24,800	...	34,23,929	...
1312	1902—1903	1,79,067	60,35,358	1,78,935	60,30,909
1313	1903—1904	2,87,085	57,61,703	2,86,066	57,41,252
1314	1904—1905	94,10,988	4,72,887	93,75,962	4,71,127
1315	1905—1906	91,26,938	1,43,812	91,25,161	1,43,784
1316	1906—1907	57,41,636	34,30,714	57,15,613	34,15,165
1317	1907—1908	29,92,718	37,36,682	29,92,159	37,36,184
1318	1908—1909	73,11,845	40,70,755	72,93,998	40,60,819
1319	1909—1910	4,11,510	1,23,202	3,91,178	1,18,013
Total ...	...	4,03,36,942	2,45,26,508	4,02,33,039	2,44,66,730
	Total net loss for ten years from 1901 to 1910 [columns 7 (a) *plus* 7 (b)]				6,46,99,769

Extracts from the Jamabandi Reports—Fasli 1300 (1890-91).

Paragraph 2, Season and rainfall.—The rainfall was favourable to cultivation in the early part of the year, but was subsequently deficent and ill-timed. In the south of the district (Pattukkottai) a severe drought up to October was followed by heavy floods, doing considerable damage to some of the villages and rain-fed tanks. The total rainfall in the year was greater than in the preceding year, being 40·47 inches against 37·28 inches in 1889-90. According to the manual, the total average for both monsoons is 40·8 inches (page 41). The average of the five years ending March 1889 was 52·75 inches. There were good freshes in the rivers in the months of July, September and October 1890.

Paragraph 3, Condition and outturn of crops.—The eastern portion of the delta received an inadequate supply of water after October, and the dry crops in parts suffered from want of timely rain.

The outturn is generally allowed to have been below the average, and if the complaints and declarations of the cultivators be believed, the deficiency was considerable. The amount of remissions cannot be taken as a gauge of the outturn, for no remission is granted on two-crop land if one crop is saved, and none is given on one-crop land unless the harvest is totally lost.

The amount remitted was only Rs. 3,142 against Rs. 24,222 in fasli 1299. In that fasli, large remissions had to be made in the Pattukkottai taluk where there is an extensive area of wet land depending entirely for irrigation on small rain-fed tanks.

Paragraph 10, Cl. 2.—The amount remitted on "waste" was Rs. 2,022 against Rs. 4,995 in the previous fasli. The remission was granted in the four taluks of Mayavaram, Shiyali, Tirutturaippundi and Pattukkottai owing to deficient rain and supply in the rivers in the latter part of the year.

Extracts from the Jamabandi Reports—Fasli 1301 (1891-92).

Paragraph 2, Season and rainfall.—The total rainfall during the year (46·70 inches) exceeded, not only that of the year preceding (40·47), but also the average of the twenty years ending 1889-90 (44·24 inches). But it was neither timely nor well distributed. Unusually copious showers in May led to extensive cultivation in the dry taluks, but the ensuing drought till October caused a very short harvest of the early crops. In December a deluge of rain flooded the Shiyali and the Mayavaram taluks, and did considerable damage. Floods also caused damage to a smaller extent in the south of Pattukkottai. The season was, however, favourable to cultivation in the latter part of the year, and the supply of water was generally sufficient for wet and garden cultivation throughout the season.

Paragraph 10, Cl. 2.—The amount remitted on "waste" was Rs. 7,884 against Rs. 2,022 in fasli 1300. The remission was granted in the three taluks of Mayavaram, Shiyali and Tirutturaippundi, and was necessitated by the failure of timely rains and freshes in the early part of the season and by floods in December. Remission was granted by the Sub-Collector with the utmost caution, and I was satisfied at the time that the grant of it could not be refused.

Paragraph 12, Cl. 2.—There is an increase of Rs. 5,096 under occasional remissions. It is due to the same reason as that given in paragraph 10 *supra*. After the floods in Mayavaram and Shiyali had subsided, the lands were again planted and the crops then suffered from insufficiency of water.

Extract from the Jamabandi Report—Fasli 1302 (1892-93).

Paragraph 2, Season and rainfall.—The total rainfall during the year was only 32·82 inches against 46·70 inches in the preceding year and 44·25 inches, the average of twenty years preceding 1890–91. In the early part of the year, from April to September, the rainfall (19·33 inches) was much in excess of that in previous years, and there was also a good supply of water for irrigation in all the rivers. Thus, fortunately, the early crops, both wet and dry, were all that could be desired. The latter part of the year, from October onwards, was marked by a very severe drought. The rainfall during this period was only 13·49 inches against 38·00 inches

in the preceding year and 28·51, the average of twenty years preceding 1890-91. There was a pitiable loss of crop, both wet and dry, in the non-deltaic portions of the district and the eastern parts of the district also suffered severely, thus necessitating the grant of large remissions. The long drought came to an end in March 1893 when there was a phenomenal rainfall which, though quite untimely, did much good in replenishing the wells on which a considerable area of maize, ragi, chillies, tobacco and other garden crops depended. The season was generally so bad that the Board found it necessary to call for special season reports, which were ordered to be discontinued only on the 8th July 1893, the season having shown a decided tendency to improve.

Vide B.P. Mis. No. 4059, dated 8th July 1893.

Paragraph 11 Cl. 2. Waste remitted and charged.—The amount remitted on waste is Rs. 5,514 against Rs. 7,884. The decrease under this item is due to timely rains in the early part of the year in fasli 1301. The remission was granted to a large extent in the taluks of Tanjore and Pattukkottai which suffered most from the failure of the monsoon, and partly in the taluks of Kumbakonam and Tirutturaippundi (Rs. 39 in Kumbakonam and Rs. 95 in Tirutturaippundi). Mr. Winterbotham satisfied himself by personal inspection that the remissions granted chiefly in Tanjore and Pattukkottai taluks were quite necessary. They are less than what he had anticipated.

Paragraph 13, Cl. 2.—There is a net increase of Rs. 22,930 under the head of occasional remissions. The total amount of remission, including waste remitted (Rs. 5,514), is Rs. 34,660, which is much below the estimate formed by Mr. Winterbotham.

Extract from the Jamabandi Report—Fasli 1303 (1893-04).

Paragraph 2, Season and rainfall.—The total rainfall during the year was 53·39 inches against 32·80 inches in 1892-93 and 44·3 inches, the average of twenty years. In July 1893 the rainfall was propitious, and compared with the previous year, there was a large area under dry cultivation. In August, September and October it was under average and the harvest of early dry crops was poor. The feature of the year was a tremendous downpour towards the end of November. The Vennar breached in several places and wide tracts of country from Tanjore down to the sea were under flood for three days. The low parts of Tanjore town were submerged and many people were saved by boats. Near Nidamangalam half a mile of the railway line was washed away. Viewing the floods at the time, it was apprehended that the loss of crop must be disastrous; but when the water subsided, it was found that the paddy was, generally speaking, none the worse for the immersion. The loss was restricted to fields recently transplanted, or where the grain was in ear: such areas were fortunately not extensive. The amount of remission granted for land submerged or inundated was only Rs. 5,789 and was confined almost exclusively to the taluks of Shiyali and Tirutturaippundi lying at the tail end of the irrigation channels of the delta and always suffering from defective drainage. There was not much difficulty felt in the delta in the early months of the calendar year.

Paragraph 10. Waste remitted and waste charged.—The amount remitted on waste was Rs. 3,854 against Rs. 5,514 in fasli 1302. The remission was granted in three taluks, *viz.*, Shiyali, Negapatam and Pattukottai.

In the Shiyali taluk the villages at the tail end of the Pudumaniyar generally suffer from want of water and remissions are usually granted for waste. In the Pattukottai taluk the indifferent character of the season in the early part of the year and the heavy floods of November necessitated the grant of remissions. The amount remitted in the Negapatam taluk was insignificant. Remission was granted with the utmost care.

Paragraph 12.—The decrease in the amount remitted under *shavi* compared with last year is due to the more favourable character of the season. Nearly the whole of the amount remitted was in Pattukottai taluk, the two taluks of Mayavaram and Tirutturaippundi giving only a small percentage. The heavy floods of November 1893 rendered necessary the

	Rs.
Shiyali	2,809
Negapatam	151
Thrutturaippundi	2,829
Total ...	5,789

grant of remission of assessment on crops damaged by submersion in the taluks of Shiyali, Negapatam and Tirutturaippundi. The amount remitted in each is given in the margin.

Extract from the Jamabandi Report—Fasli 1304 (1894-95).

Paragraph 2, Season and rainfall.—The total rainfall during the year was 35·17 inches against 53·39 inches in 1893-94 and 44·3 inches, the average of 20 years ending 1889-90. Till the close of July, the freshes in the delta rivers and channels were timely and sufficient. The progress of cultivation in the delta was normal. The local rainfall was, however, short, and in the dry parts, the cultivation was backward; but this was compensated for to some extent by the subsequent rains in August and September, so that, on the whole, the south-west monsoon was fair. The north-east monsoon rains were, however, deficient and from January onwards want of rain and water in rivers was much felt. In the upland parts of Tanjore and portions of Kumbakonam and Tirutturaippundi taluks, the wet crops suffered to a slight extent; on the whole the season was fair.

Paragraph 10, clause 2. Waste remitted and waste charged.—The amount remitted on the waste was Rs. 2,530 against Rs. 3,854 in fasli 1303. This remission was granted in four taluks—Tanjore, Kumbakonam, Shiyali and Tirutturaippundi. The amount of remission granted was highest in the Shiyali taluk, in which Rs. 1,003 was granted on lands at the tail end of the Pudumaniyar which generally suffers from want of water. Next comes Tiruturaippundi with a remission of Rs. 944. It is well known that this taluk suffers from want of proper drainage, especially in the portions round Talanayar. In Tanjore and Kumbakonam the state of season necessitated the grant of small remissions. Remissions appear to have been granted with proper care.

Paragraph 12, clause 3. Remissions.—The decrease in the amount of remissions granted on account of submerged or inundated lands was due to the absence during the year of the heavy floods which necessitated the grant of remissions in fasli 1303.

Extract from the Jamabandi Report—Fasli 1305 (1895-96).

Paragraph 2. Season and rainfall.—The total rainfall in the district during the year averaged 54·58 inches against 35·17 inches in the previous year, and 43·81 inches, the average of the 25 years ending December 1894.

In October 1895, owing to heavy rains and high floods, there were breaches in the Cauvery, in the Kumbakonam and Mayavaram taluks, and in the Coleroon, in the limits of Rettaikulam village, Shiyali taluk. In the former case, crops on about 425 acres in the Mayavaram taluk suffered, but there was no necessity for the grant of any remission. In the case of the Coleroon, lands near Kodaiyampalayam, etc., were submerged while the irrigation source of the wet lands of Rettaikulam village was cut off, in consequence of which the "wet" lands of the village were ordered to be transferred to "dry" (Board's Proceedings Mis. No. 779, dated 14th February 1896). Portions of the Shiyali taluk, where drainage is defective, also suffered from excess of rains. The remission granted in Shiyali taluk amounted to Rs. 2,177, as detailed below:—

	Rs.
Remission for waste	1,866
Do for *shavi*, "pal," etc.	311
Total ...	2,177

Paragraph 16. Waste remitted and waste charged.—The extent of waste on which assessment was remitted was 372 acres assessed at Rs. 1,866 in Shiyali taluk against 593 acres assessed at Rs. 2,530 in last year as noted below; remission for waste in holding was granted in the villages of Arasur, Kattur, Pudupatnam and Mahendrapalli, Shiyali taluk, the irrigation sources of which were cut off owing to breaches in the Coleroon at the beginning of the fasli.

8

Extract from the Jamabandi Report—Fasli 1306 (1896-97).

Season and rainfall.—The total rainfall in the district during the year averaged 49·47 inches against 54·58 inches in the preceding year and 43·81 inches, the average of the 25 years ending December 1894. The rainfall during the south-west monsoon (8·74 inches) was much below that in 1895-96 (20·27 inches) or the average of the 25 years ending December 1894 (15·71 inches); and, as a consequence, parts of the Tanjore, Tiruturaipundi, Mannargudi and Pattukkottai taluks which are dependent on rain, suffered during the period. The rainfall during the north-east monsoon (40·73 inches) was more copious than that in 1895-96 (34·31 inches). The rains of November and December 1896 were heavy and caused some damage to crops in the Shiyali taluk; while the rain in February 1897, which was unseasonable, affected the outturn of the lands, the crops on which had not been harvested till then. At the end of July 1986, the Cauvery rose suddenly to 20·20 feet in consequence of which the Coleroon, the Palavar, the Manniyar and the Arasalar breached in several places. The tracts that suffered were the country adjoining the Manniyar in Kumbakonam taluk, the northern part of the Mayavaram taluk and almost the whole of the Shiyali taluk.

On the whole, the season cannot be said to have been a good one.

Paragraph 13. Waste remitted and waste charged.—The extent of land left waste, the assessment on which was remitted, was 293 acres, assessed at Rs. 1,486 in Shiyali and Mayavaram taluks, against 372 acres assessed at Rs. 1,866 in the Shiyali taluk in fasli 1305. The extent of waste charged was 128,220 acres against 110,635 acres in fasli 1305. The increase was due to the less favourable character of the season.

Paragraph 15, clause 2. Submerged or inundated (Item 3).—The increase of Rs. 873 was due to floods which necessitated grant of remissions as detailed below:—

	Rs.
Tanjore taluk	21
Kumbakonam taluk	156
Shiyali taluk	1,007
Total ...	1,184

Extract from the Jamabandi Report—Fasli 1307 (1897-98).

Paragraph 2, Season and rainfall.—The total rainfall in the district during the year averaged 30·20 inches against 49·47 inches in the preceding year, and 43·81 inches, the average of 25 years ending December 1894. The rainfall during the south-west monsoon (18·07 inches) was more copious than 1896-97 (8·74 inches) and the average of the 25 years ending December 1894 (15·71 inches). This favoured the cultivation of the early crops. The north-east monsoon (12·13 inches) was, however, a failure and considerable anxiety was felt in the beginning in consequence. The rainfall in October (3·34 inches) was scarcely half, and that in November 1897 (3·04 inches), only about 28 per cent of the average (7·98 and 10·93 inches, respectively). This scanty rainfall retarded the sowing of dry crops and *manavari* (rain-fed) paddy, in the Kadarambam (dry) parts of the district and the rain-fed "dry" and paddy crops sown with the aid of rain in September 1897 suffered much for want of rain. In the deltaic portion "*manavari*" (rain-fed) paddy crops shared the same fate as those of upland portion. The supply of water in the rivers was short in this season, and consequently wet crops in parts of Tanjore, Mayavaram, Shiyali and Nannilam fared badly. In the southern and western parts of the Pattukkottai taluk, the *samba* paddy crop withered in small patches here and there as also the "Kuttalai" and "Kumbalai" paddy crops on high land in the Manargudi taluk. The state of

	Inches.
North-east moonsoon—	
Average rainfall in 1896-97 ...	40·73
" " 1907-08 ...	12·13
Average of 25 years ending December 1894 ...	28·10
Total rainfall (both monsoons) 1896-97 ...	49·47
" " 1897-98 ...	30·20
Average 25 years ...	43·81

crops was, however, considerably improved by the rainfall of December 1897 (4·04 inches) which was not too late to save the crops, though the outturn was affected. On the whole, the season, though not good, scarcely deserves to be classed as bad.

Paragraph 11. Waste remitted and waste charged.—The extent of land left waste, the assessment on which was remitted, was 798 acres assessed at Rs. 3,146 in Mayavaram, Shiyali, Nannilam, Tirutturaippundi and Pattukkottai taluks, against 293 acres assessed at Rs. 1,486 Shiyali and Mayavaram taluks in fasli 1306.

The extent of waste charged was 132,098 acres against 128,220 acres in fasli 1306. The increase is due to the less favourable character of the season.

Paragraph 13, Cl. 2, Shavi or loss of produce. (Item *1*).—The remissions under this head were granted in the following taluks:—

	Rs.
Tanjore	313
Mayavaram	2,055
Tirutturaippundi	125
Pattukkottai	2,124
Total ...	4,617

and was necessitated by the failure of the noth-east monsoon as explained in paragraph 2 above.

Cl. 3, Submerged or inundated.—Rupees 1,487 were remitted under this head in the following taluks :—

	Rs.
Negapatam	788
Tirutturaippundi	699
Total ...	1,487

During September and October 1897 there were high floods in the Vedaranniyam canal as well as in the Harichandranadhi which falls into the canal. The canal water overflowed its banks and breached them in some places. The floods in the irrigation channels also rose high and the combined floods lay on the ground for a number of days together and the crops affected thereby were much damaged. The Executive Engineer, Negapatam Division, has stated that necessary arrangements have been made to strengthen the banks of the canal and prevent similar damages in future.

Extract from the Jamabandi Report—Fasli 1308 (1898-99).

Season and rainfall.—The total rainfall in the district during the year averaged 58·25 inches against 30·20 inches in the previous year and 43·81 inches, the average of the 25 years, ending December 1894. The rainfall during the south-west monsoon (15·98 inches) was less than in the previous year (18·07 inches), but a little above average of the 25 years ending December 1894 (15·71 inches). The rainfall during the north-east monsoon (42·27 inches) was much greater than in the previous year 12·13 inches and much above the average of the 25 years ending December 1894 (28·10 inches). The rainfall during November (18·92 inches) and December 1898 (12·35 inches) was very heavy with the result that, owing to floods in the rivers, breaches occurred and wet crops were damaged in several places, chiefly in Mayavaram, Shiyali, Nannilam, Negapatam and Tirutturaippundi taluks. The damage to crops, however, was not great. In Shiyali, a large extent of land was re-cultivated, while in parts of Negapatam and Tirutturaippundi re-cultivation was not possible owing to defective drainage. The dry crops fared well during the year, except in a portion of the Tanjore taluk, where the groundnut crop suffered from excessive rains. On the whole the season may be said to have been favourable.

	Inches.
North-east monsoon—	
Average rainfall in 1897-98 ...	12·13
,, ,, in 1898-99 ...	42·27
Average of 25 years ending December 1894	28·10
Total rainfall (both monsoons), 1897-98 ...	30·20
,, 1898-99 ...	58·25
Average, 25 years	43·81

Waste remitted and waste charged.—The extent of land left waste, the assessment on which was remitted, was 1,593 acres assessed at Rs. 6,426 in Mayavaram, Shiyali and Tirutturaippundi taluks against 797 acres assessed at Rs. 3,145 in Mayavaram, Shiyali, Nannilam, Tirutturaippundi and Pattukkottai taluks in fasli 1307 and this is due to larger extent of wet land having had to be left uncultivated in Tirutturaippundi taluk which has not proper drainage owing to the heavy rains and floods from October to December 1898.

Paragraph 13. Submerged or inundated.—The increase as compared with previous year is due to the heavy rains of November and December last and the consequent floods and breaches adverted to in paragraph 2 *supra*. The largest amount was granted in Tirutturaippundi taluk which adjoining the Vedaranniyam canal suffers from defective drainage. The improvement of the drainage of the rivers of this taluk which at present discharge themselves into the canal, seems to be under the consideration of the Public Works Department. The villages of the Negapatam taluk in which remission was allowed are also those which similarly suffer from defective drainage, being situated by the side of the canal. Portions of Mayavaram, Shiyali and Nannilam taluks which are situated at the eastern extremity of the delta also suffered from the heavy rains and floods and hence the remissions in them.

Extract from the Jamabandi Report—Fasli 1309 (1899-1900).

Paragraph 2, Season and rainfall.—The total rainfall in the district averaged 44·02 inches against 58·25 inches in the previous year and 43·81 inches, the average of the twenty-five years ending December 1894. The rainfall during the south-west monsoon (16·42 inches) was a little in excess of that of the previous year (15·98 inches) and of the average of the 25 years ending December 1894 (15·71 inches). The rainfall during the north-east monsoon (27·60 inches) was much less than in the previous year (42·27 inches) and a little less than the average of the 25 years ending December 1894 (28·10 inches). The season began with heavy rainfall in April coupled with freshes which lasted from the middle of April till the beginning of May. In May, the rainfall was about the average, and in June, July and August below it. The freshes which lasted from about the middle of June to the end of August were so scanty that the water failed to reach many of the lower reaches. The result was that (1) crops transplanted in July and beginning of August, and the seedlings perished in many places about the middle of August, and (2) the cultivation of 136,554 acres of wet land was retarded. September had its average rainfall as also freshe; but this was followed by the October rains which were excessive, especially along the coast in Shiyali, Mayavaram and Negapatam where the rainfall amounted to 25·69, 24·49 and 29·10 inches, respectively, in the week ending 28th October, resulting in the greater portion of the lately transplanted crops being seriouly damaged or totally destroyed over large tracts near the coast in Shiyali, Mayavaram and Negapatam and in the eastern portions of the Nannilam and Tirutturaippundi taluks. Added to this, the storm of the 12th November damaged the standing wet crops throughout the Negapatam taluk, along the sea coast in the Mayavaram taluk and in parts of the Mannargudi taluk. Further, owing to the absence of any rain to speak of from the middle of November and great scarcity of water in the rivers, the crops on a large portion of the cultivated area in the several taluks of the district failed. On the whole the season was extremely unfavourable.

	INCHES.
NORTH-EAST MONSOON—	
Average rainfall in 1898-99 ...	42·27
Do 1899-00 ...	27·50
Average rainfall of 25 years ending December 1894	28·10
Total rainfall (both monsoons), 1898-99 ...	58·25
Do 1899-00 ...	44·02
Average rainfall of 25 years ending December 1894	43·81

Paragraph 11, Waste remitted and charged.—The extent of land left waste, the assessment on which was remitted, was 33,361 acres assessed at Rs. 1,70,089 extending over all the taluks against 1,593 acres assessed at Rs. 6,426 in fasli 1308 in Mayavaram, Shiyali and Tirutturaippundi.

The extent of waste charged was 168,535 acres against 132,318 in fasli 1308. The increase is due to the extremely unfavourable character of the season.

Paragraph 13.—Occasional remissions.—The increase against items 1 (*Shavi* or loss of produce), 3 (submerged or inundated), 4 (tirvakammi), and 5 (fasalkammi or second crop not cultivated) is due to the extremely unfavourable character of the season (*vide* G. O. No. 341, dated 10th April 1900, communicated in B. P. Mis. No. 2430, Revenue Settlement, Land Records and Agriculture, dated 15th May 1900, and G. O. No. 2267, dated 21th August 1900, communicated in B. P. Mis. No. 4522, Revenue Settlement, Land Records and Agriculture, dated 3rd September 1900).

Extract from the Jamabandi Report—Fasli 1310 (1900-01).

Season and rainfall.—The total rainfall in the district during the year averaged 49·54 inches against 44·02 inches in the previous year and 44·40 inches, the average of the 30 years ending 31st December 1899. The rainfall during the south-west monsoon (19·82 inches) was in excess of that of the previous year (16·42 inches) and of the average of the 30 years ending 31st December 1899 (15·77 inches). The rainfall during the north-east monsoon (29·72 inches) also exceeded that of the previous year (27·60 inches) and the average of the 30 years ending 31st December 1899 (28·63 inches). The season commenced with heavy rains in April. Owing to high floods in the rivers in July and August, some of the rivers and channels overflowed their banks, and breaches occurred in several places, wet crops and seedlings in the taluks of Shiyali, Mayavaram, Kumbakonam, Nannilam and Tanjore having been submerged and damaged in consequence. The damage caused, however, was not great and almost the whole of the flooded lands was cultivated. The crops in some of the villages in the Talanayar group (Tirutturaippundi taluk) where drainage is defective suffered to some extent by the rains of November and December. On the whole, both the wet and dry crops fared well during the year.

Items 1 to 5, occasional remissions.—The decrease against items 1 (*shavi* or loss of produce), 3 (submerged or inundated), 4 (tirvakammi), 5 (fasalkammi or second crop not cultivated) is due to the favourable character of the season in fasli 1310, while that of the previous year was extremely unfavourable.

The remissions under "submerged or inundated" and "fasalkammi" were due to the floods in July and August 1900. The sum of Rs. 876 shown under the former head in Tanjore represents one-third of the assessment on registered double crop land, the crops on which were lost by the floods and relates chiefly to the villages of Sathanur (Rs. 218) and Maruvur (Rs. 636) referred to in Board's Proceedings No. 182, dated 21st June 1899: while the sum of Rs. 832 shown against Tirutturaippundi relates to two villages in the Talanayar range wherein crops have similarly lost. The amount shown under "fasalkammi" represents the second crop charge on registered single crop lands, the first crop on which was lost by floods.

Extract from the Jamabandi Report—Fasli 1311 (1901-02).

Season and rainfall.—The total rainfall in the district during the year averaged 46·19 inches against 49·54 inches in the previous year and 44·40 inches, the average of the 30 years ending 31st December 1899. The rainfall in the south-west monsoon was somewhat less than that of the preceding year, though in excess of the average of the 30 years ending December 1899. The rainfall during the north-east monsoon was also slightly less than that of the previous year, though it exceeded the 30 years' average to an inappreciable extent. The year commenced with a poor rainfall in the months of April, May and June. There were some breaches in the month of July 1901 in the Cauvery near Kumbakonam and in some of the minor rivers and branches owing to high floods, but they were soon closed and there was not much loss or damage as the floods soon subsided. Both the wet and dry crops fared well during the year.

Extract from the Jamabandi Report—Fasli 1312 (1902-03).

Season and rainfall.—The total rainfall in this district during the year averaged 49·86 inches against 46·19 in the previous year and 44·40 which is the average of the 30 years ending December 1899. The rainfall in the south-west monsoon

Paragraph 9. Remissions.— Remissions amounting to Rs. 75,928 were granted on account of occasional and fixed remissions during the fasli against Rs. 1,02,413 in the previous fasli. Details of the net decrease of Rs. 26,485 will be found in statement No. 4. The bulk of the season remissions appertains to the Pattukkottai taluk, where a remission of Rs. 14,524 was granted on account of *shavi*. On the other hand, there was practically no remission on account of floods.

Extract from the Jamabandi Report—Fasli 1318 (1908-09).

Character of the season.—The rainfall was inadequate during July and August, but was above the average in September. The rainfall during the south-west monsoon was, on the whole, less than the average for the period. The freshes in the rivers were a month late. In consequence of this there was an appreciable decrease in the extent of wet cultivation during the south-west monsoon as compared with the previous year. In October, the rainfall was much above the average, but fell off again in November and December. The general result was that the wet cultivation was retarded and crops more or less damaged. Remission of land revenue was granted to the extent of Rs. 24,040-10-0 in Shiyali, Mayavaram, Nannilam, Negapatam, Tanjore and Pattukkottai taluks. Taking the district as a whole, the season must be considered to have been unfavourable. No calamity of any importance occurred during the year.

Taking the district as a whole, the extent cultivated was somewhat smaller than in the previous fasli. This may be attributed to the absence of timely rains and to late freshes.

The bulk of the season remissions appertains to Mayavaram and Shiyali taluks. Remission on account of *shavi* was less than in the previous year but the amount of flood remissions was larger. The district as a whole suffered from scanty rainfall in July, August, November and December, but the Mayavaram and Shiyali taluks suffered from excessive rains in September and October.

Extract from the Jamabandi Report—Fasli 1319 (1909-10).

Character of the season.—The rainfall was inadequate in July, but was above the average in August and September 1909. The rainfall during the south-west monsoon was sufficient and the freshes were received early in the rivers. In consequence, there was increase in the extent of cultivation during that period compared with that corresponding in the previous year. The north-east monsoon was a failure and this accounts for the decrease in the first and second crop under dry cultivation. There was, however, an increase in the extent of cultivation under first and second crop under wet, owing to freshes having continued to flow in the rivers sufficient to encourage the sowing of short crops but these suffered badly from insufficiency of water and in consequence, the remission of land revenue to the extent of Rs. 71,318 was granted. Taking the district as a whole, the season must be considered to have been unfavourable. No calamity of importance occurred during the year.

The extent cultivated in the district showed a small decrease comprised of an appreciable decrease in the non-deltaic taluks and Negapatam and a small increase in the other taluks—the result of short rainfall especially in the north-east monsoon. The season may be described as favourable in the deltaic tracts and a little less than favourable in the rest of the district.

The bulk of the season remissions appertains to Tanjore, Pattukkottai (dry) and Mayavaram (deltaic) taluks. Remission on account of *shavi* was much greater than in the previous year, but the amount of flood remission was less. The results are explained by the scanty rainfall from October 1909 to January 1910 and the excess of water due to untimely rain and want of drainage facilities in the taluks of Shiyali and Negapatam.

Exhibit My. 13.

Note on the "Average estimated natural flow" during the hot weather at Sivasamudram.

Madras have asked for the precise meaning conveyed by the expression "Average estimated natural flow" used by Mysore in paragraph 88 of My. 9 and subsequently in paragraphs 16 and 74 of My. 12.

2. A statement is attached showing the average flow in cusecs measured at Sivasamudram for each fortnight in the hot weather, February to May, for the years 1903 to 1907 inclusive. From the averages of the several years, a general average for the five years 1903 to 1907 has been derived and shown in column 12 of the statement.

3. The area of hot weather irrigation in 1910, as given by Madras, is 46,224 acres; part of this appears to have come into existence in recent years after the installation of the power works and cannot claim water as a prescriptive right. Even taking this larger area, the limit quantity of water necessary for it would be about (40,000/100) 400 cusecs, taking 100 as the average duty for the season. Allowing for fluctuations in river supply and transmission losses, a maximum limit supply of about 600 cusecs would be sufficient for the above area. With this consideration the limit of the "average estimated natural flow" up to which Madras would be entitled in case the power supply is stopped, are shown in column 13 of the statement. These are generally the same as the actual averages shown in column 12 except that the nearest round figures have been taken subject to a limit of 900 cusecs against 600 actually required for the crops. All excess flow above these limits will be available for impounding in Mysore.

4. The power works were started in August 1902 and the discharge figures have been taken for five summers from 1903 to 1907 only, as the channel conservancy operations were started after this date.

It may be stated that these averages are somewhat higher than those due to the correct discharges because (*a*) the Sivasamudram discharge on which the present figures are based, err on the side of excess, and (*b*) the draw-off for the hot weather irrigation in Mysore has been restricted since the power works were started.

KARPUR SHRINIVASRAV,
Mysore Representative.

28th January 1914.

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Exhibit My. 13-a.

AVERAGE estimated natural flow of the Cauvery at Sivasamudram.

Months and fortnights	1903		1904		1905	
	Total	Average	Total	Average	Total	Average
1	2	3	4	5	6	7
February ... First half	23,316	1,665	21,834	1,656	13,386	956
February ... Second half	12,072	862	20,374	1,455	14,035	1,003
March ... First half	9,366	621	15,595	1,010	8,591	573
March ... Second half	7,326	458	13,260	830	4,794	299
April ... First half	4,451	297	13,855	921	4,643	310
April ... Second half	4,855	321	14,510	967	7,252	483
May ... First half	16,269	1,085	31,909	2,127	7,138	476
May ... Second half	84,980	5,311	121,457	7,591	72,432	4,528

Months and fortnights	1906		1907		Average of five years	Proposed limits	Remarks
	Total	Average	Total	Average			
	8	9	10	11	12	13	14
February ... First half ...	10,638	760	14,783	1,056	1,219	900	
February ... Second half ...	6,416	458	6,961	497	855	850	
March ... First half ...	5,353	357	7,182	479	615	600	The figures have been taken from the discharge statements already supplied to Madras.
March ... Second half ...	3,598	225	5,630	352	433	450	
April ... First half ...	2,340	156	7,714	514	440	450	
April ... Second half ...	1,853	124	19,449	1,297	639	650	
May ... First half ...	1,689	126	16,972	1,131	989	900	
May ... Second half ...	11,226	702	23,859	1,491	3,925	900	

KARPUR SHRINIVASRAV,
Mysore Representative.

28th January 1914.

Exhibit My. 14.

A note on the remissions and loss of crops in the Cauvery delta.

The Jamabandi reports of the Collectors produced by Madras mostly deal with local conditions of rainfall and season prospects and the valuation of crops depending upon so many causes known and unknown, is based on more or less indefinite data. Even if they were definite, the conclusions about the loss of crops have scarcely any bearing on the question of impounding.

2. The causes of remissions as well as of loss of crops have been grouped by Madras under three heads which really reduce themselves to two heads, *viz.*—

(i) Deficient supply of water.
(ii) Submergence of lands.

The effect of the reservoir will, if anything, tend to reduce the submersion of lands by floods; and therefore the second condition will be a reason for, rather than against, the construction of a reservoir and need not therefore be further considered.

3. The first condition, *viz.*, loss due to deficient supply, is not really affected by the reservoir as the impounding will be practically confined to quite a limited number of days in the height of the monsoon season. On many of these days, the impounding in the Mysore reservoir cannot possibly prevent the flow at the Cauvery Dam from exceeding the limit of 6 feet as the reservoir dominates only a limited portion of the catchment. A reference to paragraph 99 of My. 12 will show that, in the worst year on record, 1899-1900, out of 32 days of impounding, there would have been such excess flow on as many as 26 days.

4. In fact the method of impounding and regulation proposed by Mysore automatically ensures that the periods of deficient supply in the river are left undisturbed and the natural flow will not be interfered with at all during such periods. Any small differences in the incidence or quantity of flow that may be caused by such impounding, have been shown to be quite of an insignificant nature and their effects, if any, are at once remedied by large quantities of water generally available on the immediately succeeding days.

5. Thus, the question of remissions or loss of crops does not affect the present controversy as already explained in paragraphs 63, My. 7 and 65, My. 9.

KARPUR SHRINIVASRAV,
Mysore Representative.

28*th January* 1914.

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Exhibit My. 15.

Note on the Cauvery channels above the Upper Anicut.

With the object of finding a relation between the stages of flow in the river at the Cauvery Dam with those at the heads of the upper channels, Madras have selected three typical channels (Pugalore, Maradur and Wyyacondan) and compared the gauge readings at their heads with corresponding readings at the Cauvery Dam for three years 1911, 1912 and 1913 by means of tabular statements and diagrams.

2. From the diagram for the Pugalore channel it will be seen that its full supply reading of 5·15 has been obtained even with a gauge of less than 5 feet at the Cauvery Dam; and with 6 feet this full supply has been amply secured.

3. In the case of the Wyyacondan channel, the full supply level of 5·75 and even as much as 6·1 has been obtained with a gauge reading of 6 feet at the Cauvery Dam. Also, the full supply level of 5 feet (4·9) for the Maradur channel has been obtained with about 6 feet (5·9) on the Cauvery Dam. It may be noted that, in the latter two diagrams, the readings are so irregular that no definite conclusions can be drawn from them.

4. From what has been said above there is good reason to expect that a reading of 6 feet on the Cauvery Dam will be sufficient to give "full supply level" of these channels. But it has been stated in paragraph 78 of My. 12 that the comparatively low stages of the river between 3½ and 5½ feet on the Cauvery Dam (which alone can be depended on for the greater part of the season) determines the limit of irrigation under them as the channels take off direct from the river without anicuts.

5. Mysore have already provided in their rules for a limit flow of 6 feet in the height of the monsoon from 1st July to 15th September. The lower limits in other months are in conformity with the natural stages of the river in those months, when also there is practically no impounding as shown by the tables. The supply to these channels will therefore not be affected by the limits proposed by Mysore as already clearly explained in paragraphs 76 to 81 of My. 12.

KARPUR SHRINIVASRAV,
Mysore Representative.

28*th January* 1914.

Exhibit Ma. 21.

Note on the stage of flow required to give full supply to the Madras Cauvery channels above the Upper Anicut.

This note is a rejoinder to the Mysore note, dated 28th January 1914 (My. 15), of which a copy was received by the Madras Government on 29th January 1914.

2. It is not practicable to transform stage of flow at the various channel heads to a corresponding stage at the Upper Anicut, but it is possible to draw reasonable assumptions from the diagrams Ma. 18-a, b, and c. On these diagrams two lines are drawn showing what is considered fair representation of the limits of flow and high stage of gauge reading at the Upper Anicut corresponding to each stage of river flow at the point of off-take.

It is claimed that the lower of these two lines in combination with the height of the head sluice upper gauge which can give full supply fairly shows the limit stage below which impounding will deprive these channels of useful supply. This stage is shown below:—

	Acres.	Full supply in front, feet.	Stage at Upper Anicut, C. D. gauge.
For Pugalore channel	2,400	5·15	5·9
For Marudur nattu voikal	6,500	4·90	6·5
For Wyyacondan	26,000	5·75	6·5

The claim now made is that a stage of 6½ feet is required to give full supply to the upper channels.

3. It will be noticed there are isolated readings below the lower line. These may be explained as possibly on some occasions due to errors, but generally they are considered due to the fact that the leading channels between the river and the sluices (except Pugalore sluice) are long, about half mile in the case of Marudur channel and over one mile in the case of Wyyacondan channel. All the channels run across the drainage of the country and take in cross-drainage. Thus, it not infrequently happens that the channels have nearly full supply from that source and that the sluices are regulated only to admit a portion of the full supply. Under such conditions, the surface fall of the water in the leading channel would be materially reduced and therefore a higher front gauge reading would be realised than would be possible under normal conditions in which all the supply has to be passed in from the Cauvery.

The Marudur nattu voikal is a channel which especially is liable to inflow of water from local cross-drainage. In such times, the head sluice would be either altogether closed or nearly so and the specially numerous discrepant low gauge readings of the diagram of this channel may be attributed to this cause. Under this explanation, it is claimed the lower lines in the diagrams fairly represent the true limit.

W. M. Ellis, Col., R.E.,
Madras Representative.

2nd February 1914.

Exhibit Ma. 22

MADRAS THIRD REJOINDER TO MYSORE REPLY—MY. 12.

PART XI.—LEGAL ARGUMENTS.

1. Much as the Madras Government would prefer to avoid saying anything by way of retort, they are unable to leave unchallenged the suggestion in paragraphs 1 to 7 of My. 12 of "changes of position primarily on the part of Madras." Such allegations, unless clearly well-founded and substantially correct, can serve no useful purpose, but it takes up a regrettable amount of time and space to expose them so as to correct the erroneous impressions they are calculated to leave. But for the lengthiness and number of the pleadings and memoranda, this Government would have gladly left them to speak for themselves.

Reference-My. 12, paragraphs 1 to 7.

(*a*) The first statement in paragraph 2 of My. 12 is that *after much discussion* it was *conceded by Madras* that it would be sufficient to determine the rights of Madras as legally acquired and actually existing in 1910. This is far from correct. The Madras Government never controverted the proposition; it is the Durbar that at one stage put forward a suggestion inconsistent with it. As was explained in paragraph 3 of Ma. 3 (see also Ma. 1-*d*), the earlier correspondence on the part of both the States was confined to the quantity of water which Madras required *under the conditions existing* in 1910; and even when suggesting the draft terms of reference as late as the 4th July 1913, the issue proposed by this Government was "what is the quantity of water to which Madras is entitled for requirements of *existing irrigation*" (see My. 1-*a*, paragraph 6). The basis of calculation of prescriptive rights" was not adverted to and much less disputed; and it is much in the same spirit that in the first Madras Statement (Ma. 1) this Government contented themselves with putting forward their proposals (*vide* Ma. 1, paragraph II). It will also appear from My. 1-*a*, that it was the first issue proposed by the Durbar (about the end of June 1913) that sought to fix the rights of Madras to what they were *when the Agreement of* 1892 *was made* (and not, as they would now have it, to what they were in *1910* on the basis of the Agreement of 1892) and Madras took exception to this limitation in their telegram to the Resident dated 4th July 1913 (*vide* paragraph 6, My. 1-*a*). From paragraphs 4 to 8 of Ma. 1-*d*, it will be seen that, even on the 21st of July 1913, the Madras Representative continued under the impression that Mysore sought to define Madras rights by what they were in 1892, whereas his own contention was that according to the Agreement Madras would be entitled to *those existing at the date of dispute.* Madras had thus invariably and all along based their claim on the Agreement of 1892 on the footing that their rights under the Agreement were those which they were exercising in 1910. It is only in My. 1-a that the Durbar took exception to Madras referring to *existing irrigation* and stated that Madras were only entitled to such rights as are given to them by the Agreement of 1892, and in My. 1 the Durbar defined these rights as those actually exercised by Madras about the year 1890 and continuously enjoyed thereafter till 1910. Though My. 1-*a* is dated 12th July 1913, it was put in before the Arbitrator only on the 21st July, *i.e.*, some days after Ma. 1 had been put in and even after Ma. 1-*d*. Madras unhesitatingly accepted the view that they are entitled to the quantity they had a prescriptive right to in 1910 (*vide* Ma. 3) and thence forward the only difference (as pointed out by the Arbitrator himself) was as to the *extent* of such right. Even in Ma. 1-*d*, the Madras Representative had stated that if new proposals should be put forward by Mysore, the Madras rejoinder "may take the form of an alternative statement of our demands." This is what was done in Ma. 3, in answering paragraphs 3 and 4 of My. 1.

(*b*) Paragraph 2 also refers to an alleged concession supposed to be wrung from Madras that under the Agreement of 1892 Madras could acquire a right by prescription "only to what they have been utilizing for *irrigation*" and reference is made to Ma. 1 (evidently Ma. 7), paragraph 32 and Ma. 14, paragraph 12. This, again, is not correct. The position accepted by Madras is that their prescriptive right is measured by the accustomed flow restricted by the limit of *user* of the water. This certainly had not to be extorted from Madras as a concession "after much argument," as is evident from the very fact that their claim throughout has been to a *limit flow* based on their requirements and past user. The user by Madras has been for purposes connected with irrigation and that is accordingly the user on which their claim is founded; but Madras have all along maintained that, in determining the extent of the prescriptive user in the past, the user to be taken account of covers not merely the water actually put on the fields, but also the water used for purposes incidental to irrigation, such as scouring, raising the level of the water in the stream, etc. In respect of these questions, there has never been any "change of position" on the part of Madras.

(*c*) Paragraph 3 would seem to have been put in only for want of a better argument and the assumption that Madras was ignorant of the pleadings in the case is purely gratuitous. A perusal of paragraphs 3 to 12 of Ma. 7 ought to convince one that the "indefiniteness" of the first issue is adverted to in paragraph 3 not as an "objection" but to explain the endeavour in the subsequent paragraphs to deal with the several points which (so far as one could gather from the pleadings and other materials) may be considered to fall under the general language of the issue. Paragraphs 4 and 5 merely eliminate certain questions. Paragraph 7 deals with the application of the words "fair and reasonable" in rule III of the Agreement; paragraphs 8 to 10 with the bearing of Sir K. Sheshadri Iyer's memoranda of 1890 and 1899; and paragraphs 11 and 12 with the "law of prescription" likely to have been contemplated by the Agreement. The question had to be dealt with in this somewhat hypothetical form, because there was nothing on record to indicate with any precision what were all the questions intended to be brought in under the head of "interpretation." No such issue had been put forward in any of the draft terms of reference suggested by Madras or Mysore or by the Government of India. On the 7th August 1913, the Madras Representative expressly raised the question of making the first issue more specific, but the Arbitrator seems to have thought it unnecessary and made the suggestion (referred to in paragraph 8 of Ma. 7) that it should be understood in the light of the memorandum attached to My. 2 and the arguments directed to the points raised in that memorandum. This made the issue very comprehensive. In any court of law, these memoranda (of Sir K. Sheshadri Iyer) would have been ruled out as irrelevant to the question of "construction"; but in view of the position then taken up by Mysore and the suggestion of the Arbitrator, the theories and hypotheses put forward by Sir K. Sheshadri Iyer had to be dealt with in Ma. 7. As pointed out in paragraph 13 of Ma. 7, Mysore had not altogether abandoned these views in framing their pleadings. They also thought fit to make allegations of "one-sidedness" against the Agreement and a suggestion of "pressure" by the Government of India in bringing it about. Even during the course of these proceedings, the Mysore Representative desired the Arbitrator to express his opinion on the merits of the Agreement. The Madras Government were thus compelled to examine the question in all its possible aspects to show the untenability of Sir K. Sheshadri Iyer's theories and to disprove the allegations of one-sidedness. It was *after* that memorandum (whether it was *on account of it* or not, it is unnecessary to enquire) that the Durbar came forward with a statement in My. 6 that "Mysore do not rely on any unlimited natural right at all in *this particular case* (paragraph 10; the italics are ours) and the allegation of "one-sidedness" in the Agreement was no longer adverted to. It thus becomes unnecessary for Madras to dwell any further on the question of the precise scope of the first issue. It is, however, worth nothing that in spite of the disclaimer of "natural rights" in paragraph 10 of My. 6, the Durbar still cling to Sir Sheshadri Iyer's theories when they observe (in paragraph 3 of the same) that his memorandum of 1890 with the forwarding letter to the Resident, etc., presents a very complete and cogent exposition of the Agreement of 1892 and.....the

opinions.....cannot but be entitled to great weight at the hands of the Arbitration Committee, etc.

(*d*) The arguments on the question of "permissive user" and "joint possession" were necessitated by the reference to these in Sir K. Sheshadri Iyer's memorandum.

(*e*) The suggestion in paragraph 5 that Madras at first objected to the form of issue 2 (*a*) and that the objection was given up later on, is clearly erroneous. It will be noticed that paragraph 6 of Ma. 7 occurs in the course of discussion of the scope of the *first issue*. The second sentence of the paragraph expressly admits the relevancy and propriety of the question raised by the second issue. The point sought to the maintained in the paragraph is that Mysore are not right in the construction of paragraphs 3 and 4 of the Agreement suggested by them in paragraph 16 of My. 1 and the corresponding paragraph of My. 4. The Madras Government have not changed their position in this respect; but, as stated already, the question originally came up under issue 1 and as there has been no subsequent discussion of that issue and the Durbar did not think fit to pursue this particular point any further, the question has not been since adverted to.

(*f*) The allegation in paragraph 6 is alike incorrect and misleading. It mixes up two questions raised by Madras and in neither of them have Madras ever *changed their position*. As stated already, Madras did maintain and still continue to maintain that it is not the function of the Arbitrator "to devise a method" for the best utilisation of the water, but to decide on particular proposals of the Durbar. As to the introduction of the element of "fair and reasonable" in deciding the question of the *extent* of Madras prescriptive rights, it is amusing to find that the Durbar state that the "challenge was practically dropped." The Mysore argument which is imagined to have led to this result is that contained in paragraph 9 of My. 6, and the Madras reply to it will be found in Ma. 11, paragraph 4. It will be seen that, far from showing any intention to give up the original argument, this paragraph in the Madras reply asserts again that the element of "fair and reasonable" cannot be introduced into the consideration of the question of the *extent of the prescriptive right* (whether on the point of fact or on the point of law). The Durbar make a point of the fact that an argument is not repeated over and over again in every memorandum. For obvious reasons, it was considered unnecessary merely to repeat an argument in the old form, *i.e.*, unless there was anything new to add or to reply to. But there never has been any doubt or ambiguity as to the position taken. In paragraph 23 of Ma. 14, the words occurring are "the arguments derived by Mysore for this purpose from the words "fair and reasonable" in clause 3 of the Agreement is a perversion of the provision, etc. To any lawyer the proposition that a prescriptive right is to be measured with reference to an imaginary standard of fairness cannot but sound strange. As already pointed out, the words "fair and reasonable" can properly be held to refer not to the ascertainment of the *extent* of the right, but only to the mode in which the enjoyment of the rights so ascertained is to be secured." One cannot be expected to use stronger language than this to re-assert the *original* contention of Madras and it passes one's comprehension to understand how the Durbar construe this as a change of position, or as dropping the challenge, and in fact practically admitting their contention.

(*g*) As to the allegations in paragraph 7, the reasons which necessitated the discussion of the doctrines of international law and the law of riparian rights in Ma. 7 have been set forth under head (*c*) above. It is surely ridiculous to suggest that the law of prescription was almost entirely disregarded in Ma. 7, and that Mysore had to come to the rescue by drawing attention pointedly to this error. The question of the law of prescription and of the extent of the prescriptive rights of Madras is dealt with at length in paragraphs 18 to 36 of Ma. 7 and some of the Mysore objections to the *extent* of the Madras claim are dealt with in paragraphs 37 to 46 of Ma. 7. Of course the Durbar cannot expect the Madras arguments to be just what the former wish or just what would suit them; and the only answer that the Durbar thought fit to make to the Madras arguments on the question of the *law* of prescription was that contained in paragraphs 10, 11 and 17 of My. 6. These may best be left to speak for themselves. Paragraph 12

of My. 6 dealt with a proposition never disputed by Madras and paragraph 13 contained no arguments. Paragraph 15 sought to bring in some arguments from the law of easements, such as, loss by abandonment, cessation of necessity, fulfilment of purpose and aggravation of the burden, etc.,—questions unconnected with "prescription" (though of course they may be said to be relevant in connection with the expression "actually existing" in rule III of the Agreement). Madras naturally could not but point out in paragraph 7 of Ma. 11 that the Mysore argument on the application of the law of prescription took no notice whatever of the numerous authorities cited in the Madras memorandum and that they were not disposed of merely by saying that they related to the usage of other countries. The arguments drawn by Mysore from the law of easements were examined and criticised at length in paragraphs 10 to 13 of Ma. 11. The answer of the Durbar to this is given in the second half of paragraph 4 of My. 9 and in Appendix Q they submitted a note purporting to show that the authorities cited by Madras have little or no bearing on the points in dispute. The soundness of the comments in Appendix Q, My. 9, is discussed in paragraphs 15 and 16 of Ma. 14. As to the law of easements, the Durbar contented themselves with stating that they referred to it only as furnishing the nearest analogy. They took no note of the Madras argument that, even on the footing of the applicability of the ordinary law of easements, their contentions were untenable (see also paragraph 21 of Ma. 14). In My. 12 the Durbar make the complaisant assumption that "Madras have said nothing to invalidate the pleas" of Mysore based on the analogy of the Law of Easements (paragraph 26). With these observations, Madras would leave it to the Arbitrator to judge which side has ignored, and found it convenient to ignore, the law of prescription.

The above rough summary of the course of the pleadings is, it is submitted, sufficient completely to disprove the allegation of "changes of position" on the part of Madras and the suggestion of "concessions" forced from them and to show on whom lies the responsibility for changes, if any.

2. Coming now to the points which Mysore regard as "still at variance," the first question dealt with by them is as to the application of Sections 26 and 27 of the Limitation Act. The Durbar contend that this question is of "much practical significance", as it explains why 1890 is taken in this case as the starting point of the prescriptive period and why Mysore urge that the enjoyment of any right claimed by Madras should be found, if the right is to prevail, to have continued to within two years of the suit (My. 12, paragraph 9). As this aspect of the question is also touched on in paragraphs 22 to 24 of My. 12, they may also be conveniently referred to and dealt with here. The Durbar say they cannot understand why Madras should, while agreeing to the calculation of their rights as in the year 1910 on the basis of the Agreement of 1892, take exception to the proposition that the Madras right is confined to what can be shown to have been uninterruptedly enjoyed for 20 years since 1890. But for this statement of the Durbar, one would have thought that point had been made sufficiently clear in every successive memorandum submitted on behalf of Madras. The Madras argument on the question consists of the following steps:—

My. 12, paragraphs 9 and 22 to 24.

(i) Sections 26 and 27 of the Limitation Act are *statutory* provisions and it is not the ordinary course when two *States* enter into an agreement, to apply to the same, the provisions of a statute which necessarily applies only to *subjects*; and, in this particular case, it would be all the more so, as it is not *necessary* to refer to any statute, for the general principles of prescription have long been known and recognised apart from any statute. This argument urged in Ma. 7, paragraph 12, was not answered by Mysore (paragraph 7 of My. 9 does not relate to this) and therefore was not repeated in Ma. 11.

(ii) Further, the rules laid down in Sections 26 and 27 of the Limitation Act cannot appropriately be applied here, because there is no "suit" and the condition that the enjoyment must be continued to within two years next before the institution of the suit cannot be complied with (Ma. 7, paragraph 20). This argument was not even adverted to in My. 6 and, though Madras re-affirmed their position in Ma. 11 (paragraph 5), the Durbar contented themselves in My. 9 with stating that it would be "proper" to presume that Sections 26 and 27 were present

before the minds of the parties and in their own way added, "This view is practically conceded". Where it is conceded, one cannot find, unless a denial means an admission. This argument is, however, now adverted to in paragraph 23 of My. 12, where on the authority of "standard dictionaries" it is suggested that for the purpose of applying Section 26 here "*suit* must be taken to mean dispute". Even the man in the street knows that a *suit* is different from a *dispute.* A dispute may have lasted for years and years before it culminates in a suit. The Limitation Act refers to the date of "the institution of the suit" as a specific and definite point of time; and the most essential requisite of a statutory rule is that its application should be certain. Which date are we to regard as the date of "institution" here? Surely, not the mere commencement of the differences between Mysore and Madras; and the impropriety of regarding the commencement of Arbitration proceedings as the "institution of suit" has been referred to as early as in Ma. 7 (paragraph 20). Mysore have urged nothing in answer to that.

(iii) It was stated in the Madras arguments that the question of the particular rule applicable was not of much practical consequence, because, except for this arbitrary limit of "two years within suit", there was no difference in substance between the rule of common law prescription and the rule enunciated by statute; and in this case, it is not alleged that anything particular had happened within two years before dispute. The changes in the Madras user which the Durbar relied on had taken place in the years 1898—1901 and their effect on Madras rights (whatever it be) would be the same whether the one rule or the other applied. The Durbar now say they lay stress on the point because, according to them, on it will depend the further question whether or not 1890 is to be regarded as the starting point for the calculation of Madras rights. It is shown in the next paragraph that even for this purpose it can make no difference.

(iv) As to the method of fixing the time with reference to which the *prescriptive user* is to be considered the Madras argument was set forth at length in Ma. 7, paragraphs 22 to 25. It is in essence this—that the rights saved by the Agreement in favour of Madras are not merely rights acquired *during the 20 years before dispute*, but rights acquired *at any time even prior thereto provided they are "actually existing" at the date of dispute.* As the Durbar plead inability to understand this proposition, let us see if there is any real difficulty in understanding it. The saving expression in rule III of the Agreement is "*prescriptive* right *already acquired* and *actually existing.*" Surely, this does not mean *only* the rights acquired during the last *20 years.* No doubt *at least 20* year's user is necessary to give a prescriptive right. But a right may have been enjoyed for 50 years before dispute and it cannot be said that it is only the user of the last *20 years* that gives the right. Applying this here, the rights of Madras in 1910 are not necessarily *only* those *acquired* by the user *between* 1890 *and* 1910. They may as well be the rights *existing in* 1890, provided they have not been *lost* since. That is why Madras object to regarding 1890 as the *starting point* for *acquisition* of rights by Madras. Madras say, "we had certain rights in 1890 (by the user of several decades prior thereto), we have not got to *acquire* them anew. Where then does Section 26 of the Limitation Act come in and why should we calculate any *new period of twenty years after* 1890? If we claim any new rights, then of course we must show the exercise of such new rights for a period of twenty years; but no such right is claimed." The further step in the Madras argument is "there were these prescriptive rights even in 1890, and we are entitled to them under the Agreement". Mysore reply, "No, you may have had those rights in 1890; but you cannot have them now under the Agreement unless those rights are "actually existing". Madras rejoin, "Yes, those rights are actually existing; because we have never given them up or lost them, but, on the other hand, are doing everything in our power to make the best use of them". It is hoped that the above analysis will show that there is no mystery or difficulty about the Madras argument on this point. The real question in the case, as will be seen from the above, is *not* whether Madras *had acquired* a right *after* 1890, but whether the long existing rights of Madras (acquired, say, by the user between 1830 and 1890) of which the parties to the Agreement were fully cognisant, can be said to be no longer "actually existing" by reason of anything that has happened in recent years. Mysore admit even in My. 12 (paragraph 24) that the Agreement does not wipe out all previous rights actually earned by Madras

and say, "but in order that they should be recognised as actually existing when the dispute arose, the necessary proofs should be adduced by Madras". Take this to be so, but that is not the same thing as *acquiring* a right by twenty years' user after 1890. Then, why hark back to Section 26 of the Limitation Act and the user for twenty years *after* 1890. The reason is not far to seek. The Durbar contend that the improvements effected by Madras in the Upper Anicut in 1899—1902 have in effect reduced the rights of Madras (in the sense of the quantity of water that Madras can claim). In the attempt to substantiate this contention, Mysore cannot naturally be content merely to urge that such improvements work a "cessation" of prior rights within the meaning of the Agreement. One would find it hard to accept the contention that one spends money on improvements for the pleasure of having one's rights cut down as a consequence. It, therefore, suits them better to argue that the rights of Madras can be regarded as acquired only by the *continuous* user of the last twenty years—they know there has been a change in the Madras user in the middle of this period. It is in this connection that reference was made on behalf of Madras to the decision of the Judicial Committee in *Commissioners of French Hock v. Hugo* (L.R., 10 Appeal Cases, 336), as laying down that a change in the user may be sufficient to *prevent the acquisition* of a right by prescription but *not to work a loss or cessation of a prescriptive right already acquired* (*vide* Ma. 7, paragraph 25, and Ma. 14, paragraph 16). The Durbar sought to distinguish that case in Appendix Q, My. 9, to their memorandum. The distinction suggested has been examined in paragraph 16 of Ma. 14 where it is shown that it only rests on the assumption that the present is a case of *acquisition by user within the last twenty years.* It is submitted that this contention of Mysore has been amply refuted.

3. It is in view of this aspect of the case urged by Madras, *viz.*, that they had long ago acquired a prescriptive right to all the water that is now claimed, that Mysore put forward two arguments—

(*a*) that even before the alterations in the Upper Anicut Madras had *not* acquired a right to as much water as they now claim, and

(*b*) that in respect of a certain portion of the water that Madras was then entitled to, namely, one foot over the Upper Anicut, the right must now be held to have *ceased* in consequence of the improvements in the Upper Anicut effected in 1898-1901.

It is in connection with the second of these arguments (*b*) that the Durbar raised the question (i) of *abandonment* of that portion of the water by Madras, (ii) *loss* of the right to the same by non-user, and (iii) cessation of the right by virtue of the cessation of the necessity therefor (treating it as an easement of necessity). There has never been any misapprehension on the part of Madras as to these contentions. The Madras answer to them was—

(i) that abandonment is a question of "intention" and facts and circumstances connected with the improvements in the Upper Anicut do not warrant the inference of an intention on the part of Madras to *abandon* pre-existing rights.

(ii) that there has been a variation in the manner of user and *no non-user* of the right in the only sense of that term known to law, *viz.*, *the absolute disuse* which alone under the law will *extinguish* an existing right and even assuming non-user, the extinction can happen only if the "non-user" continues for the prescriptive period, *i.e.*, 20 years according to Mysore.

(iii) that the rule of cessation of necessity cannot be pressed into service here: because, this is not the case of an "easement of necessity"— to which *alone* that rule applies—and there is no analogy between the reasons underlying that rule and the circumstances of the present case. The arguments in support of these answers are set out in Ma. 7—paragraphs 21, 25, 26, 27 to 29, 44, 45, in Ma. 11—paragraphs 6, 11 to 13, and in Ma. 14—paragraphs 19 to 22, and it is needless to recapitulate them here. But before leaving this question, it is necessary to add a few remarks on the Durbar's observations in this connection in My. 12, paragraph 17. In the second part of paragraph 17, it is urged by Mysore that, "even assuming for the sake of argument that Madras had earned a prescriptive right to seven feet flow in the Akhanda Cauvery prior to the remodelling, it is inadmissible under Section 26 of the Limitation Act as the enjoyment of the right

in that manner has ceased from the date of the remodelling of the anicut." This is a fair sample of their argument on this question. The fallacy underlying it can be shown in a moment. *Ex hypothesi* a prescriptive right to seven feet flow *had been acquired* by Madras prior to the remodelling. *What then has Section 26 of the Limitation Act to do?* The Durbar may urge (and evidently this is what they intend) that the right has since been lost; but Section 26 does not provide for the *loss* of the right, so why drag it in? Again, what if the enjoyment of the right *in that manner* (the italics are ours) has ceased? If we enjoy the right in *a different manner*, that cannot take away our rights. This has been the burden of the whole argument. Now look at the next sentence: "The right asserted underwent both physically and legally a radical change in consequence of the remodelling and also of the nature of the user that followed it." There can be no physical change in the *right*. The change was in the manner of the enjoyment. It is said that after the remodelling a limit flow of seven feet at the Cauvery Dam is secured without necessitating at the same time any overflow at the Upper Anicut. What of that? The right of Madras should be measured *not* with reference to their distribution arrangements (as between the right branch and the left branch) which must necessarily vary from time to time, but in terms of the required depth of flow in the main river (*i.e.*, the Akhanda Cauvery) and it is as an index to this that the seven feet depth at the Upper Anicut is constantly referred to. If this is borne in mind, the argument based on the remodelling of the anicut and its effect on the distribution of water between the right branch (Cauvery) and the left branch (Coleroon) or on the regulation of the flow in the right branch (*i.e.*, over the Cauvery Dam) can have no force. It is in view of this difficulty that the Durbar deny that Madras ever had a prescriptive right to a seven feet flow in the Akhanda Cauvery. This is question (*a*) *supra*.

4. In a sense the point covered by question (*a*) is the most material. On this the Madras claim (as already stated) is that for irrigation below the point of bifurcation of the Akhanda Cauvery this Government is by prescriptive right entitled to a limit flow of seven feet in the Akhanda Cauvery (as measured at the Upper Anicut). The Durbar dispute this claim on the following grounds:

(i) That as a matter of *fact* Madras have not for the prescriptive period used seven feet water even over the Cauvery Dam and cannot therefore be said to have enjoyed seven feet flow in the Akhanda Cauvery.

(ii) That, even if it be found that Madras have used seven feet over the Cauvery Dam, this would give a right only to *seven feet over the Cauvery Dam* and not to seven feet in the Akhanda Cauvery, because the portion of such water not flowing over the Cauvery Dam has not been *used* by Madras but merely surplussed or wasted over the Upper Anicut.

(iii) That in any event such use as Madras might have made of the seventh foot of water has not been for the purposes of irrigation and therefore cannot create a prescriptive right in favour of Madras within the meaning of the Agreement.

(iv) That, whatever may be the depth of flow required or used by Madras, the extent of Madras rights should be measured chiefly with reference to the *acreage of irrigation* in the past.

(v) That, in some seasons or months of the year, Madras could not have had or could not have used so much as seven feet flow.

These arguments have been examined fully on former occasions and it is necessary here to do little more than to state the Madras answers to them and to give references to those portions of the Madras memoranda where they are found. A few comments may then be added on the remarks in My. 12:—

(i) In answer to the first of the above contentions it is hardly necessary to state that the whole Madras case rests on the claim that a seven feet flow in the Akhanda Cauvery has been prescriptively enjoyed by Madras. The *facts* necessary to establish this have been set forth in the "facts" portion (so to say) of each memorandum and it is for the Arbitration Committee to find what they establish. But in determining the effect of these facts, it must be remembered, as stated in the authorities referred to in paragraphs 32, 34 and 35 of Ma. 7 that the "extent of user" which in the eye of the law they are held to establish is not merely that

shown by the *actual use* but that shown by the *extent of claim* and the *intention* which accompany the same. It is this principle which is constantly ignored by Mysore. The Madras case is that they have all along claimed to use a 7 feet flow in the Akhanda Cauvery and have all along worked up to it and it is in the light of that circumstance that the *actual user* must be taken into account when deciding the extent of "prescriptive use" shown by Madras.

(ii) The second argument of Mysore above noted is that set forth in paragraph 10 of My. 9 and in a slightly different form in paragraph 20. As shown in paragraphs 10, 11 and 12 of Ma. 14, this distinction between the flow over the Cauvery Dam and the flow in the Akhanda Cauvery has no foundation in legal principle. Where a claim has been *generally* asserted to a particular limit flow in the river, it is opposed to all principle to say that the right thereby acquired is to be measured not with reference to the *general level of the water*, but at a particular point where the level of the water has been artificially raised by our own works and it is all the more so when the proposal is to measure the right not by the flow in the *main river* but by the level to which the water has (by artificial means) been brought up in one of the *branches*. Madras deny that the flow into the Coleroon was altogether a mere waste. It was used (whatever be the extent of the use) for purposes connected with irrigation and there is no warrant for the Mysore contention that the extent of Madras rights *should* be measured not by the usually required flow in the Akhanda Cauvery but by the quantity used under each distributing branch. In this view, the observations in paragraphs 18 and 19 of My. 12 do not require detailed consideration. The flow always claimed is a seven feet flow in the Akhanda Cauvery and it is no answer to split it up into a six feet flow at one point and a seven feet flow (brought about by Madras works) at another point. It will be strange to hold that the prescriptive right of Madras is to vary with every engineering device by which Madras may succeed in raising the level of water at one part of the river without a corresponding depth at the other side of the stream.

(iii) It is urged that such user as there might have been of the seventh foot of flow or of the flow into the Coleroon was not user *for irrigation*. One answer to this is that the Agreement does not confine the rights of Madras to the water used for *irrigation only*. But Madras also contend that the user referred to has been for irrigation. The Durbar say [in paragraph 20 (3) of My. 12] that the Madras arguments are vitiated by the erroneous assumption that "there is no difference between using a flow required *directly* for irrigation and a flow *indirectly* connected with irrigation." Madras do not deny that for some purposes there may be a difference between the two things but they do assert that for the present purpose there is no difference between them. When a "prescriptive right to use water for irrigation" is claimed or acquired, it will cover *all purposes connected with irrigation*. The Durbar do not choose to define what they would understand by the expression "purposes of irrigation."

Reference-My. 12, paragraph 20.

(iv) The next point taken is that the right of Madras is only to take as much water as may now be required to irrigate the *particular acreage* which has been irrigated under the delta irrigation during the past 20 years. The answer of Madras is that they are entitled to take *as much water* as they have been taking in the past, *i.e.*, the full customary flow of water in the river up to a limit of 7 feet, and it is no concern of Mysore whether that quantity is used to irrigate a smaller acreage or a larger acreage. The question has been fully discussed in Ma. 7, paragraphs 31 to 36 and Ma. 14, paragraphs 13 to 18, and the authorities are conclusive on the point in favour of Madras contention. Paragraph 25 of My. 12 contains nothing new. Nobody suggests that irrigation is to be conceived of *without reference to lands*, but the conception does not necessarily involve the notion of a particular acreage. The passages quoted do not deal with the *exact extent* of the right of Madras. That is the question now.

Reference-My. 12, paragraph 25.

(v) The question of the absence or non-use of a 7 feet flow in some seasons or months of the year and its effect on the *extent* of Madras rights, has been discussed in Ma. 7, paragraphs 41 and 42. Mysore refer to this aspect in a way in paragraph 21 of

Reference-My. 12, paragraph 21.

My. 12. With reference to this it is sufficient to say that the passage from Doss on Riparian Rights cited in Ma. 14, paragraph 14, itself furnishes the answer.

5. It only remains to say a word on the argument urged by Mysore (My. 12, paragraph 28) with reference to the opinions expressed by Madras officers on certain former occasions. They say, "it is strange to find Madras contending that the opinions of the Madras officers and even of the Arbitration Committee *regarding the extent of the prescriptive rights* are of no value in this controversy" (the italics are ours). There cannot be a more palpable misstatement of the Madras argument. If the opinion of the "Arbitration Committee" *regarding the extent of the prescriptive rights* is to be of no value here, what else is the Arbitration Committee for? Surely, Madras could never have said anything so absurd. What Madras contended was (i) that the opinions expressed by Madras officers as to *what they thought would be sufficient* allowance for the delta irrigation are beside the present controversy, because we are now concerned with *what has been the actual user*. The difference will be clear on a moment's consideration. The officers referred to were not thinking of *the extent of Madras rights*; they clearly assumed that Madras could take *more* water and utilise it for irrigation elsewhere. Again, *they did not say that* 6 *feet or* 5½ *feet flow was all that was being actually taken by Madras for the delta irrigation.* On the other hand, the very tenor of their reports shows that they found more water being taken for the delta irrigation than they would consider necessary under certain different conditions and hence they went on to suggest that a smaller quantity would under certain circumstances suffice for the delta and that the extra quantity could be *better utilised* elsewhere. It is thus clear that their opinions cannot be reasonably taken into account either on the question of the *extent* of Madras rights or on the question of *the actual quantity of water taken* by Madras for delta irrigation and hence it was contended that these opinions are beside the present controversy. In calculating figures for projects, it will invariably be found that the officers concerned regard the actualities as erring on the side of excess and trying to fix what they consider necessary or sufficient for the existing requirements, proceed to suggest a better use for the extra quantity. How then can the opinion expressed by them throw light on the extent of *actual user*? If such reports do contain such figures of actuals (as distinguished from *opinions as to what would be sufficient*), Madras never objected to the figures being taken into account. It is the *opinions* that have been objected to. In the same way, Madras took exception to the Mysore argument that the opinion of the Arbitration Committee as to what they would consider *sufficient* should decide the question of the *extent of the prescriptive rights.* This is merely a different aspect of the Mysore argument on the application of "fair and reasonable". It must be remembered (as is shown by the correspondence printed as Appendix A to the Madras case) that at the time the Agreement of 1892 was being negotiated the Madras Government desired that all reference to "law of prescription" should be dropped and the whole matter settled on the basis of "fair and reasonable." It then suited Mysore to insist that this would not do and they urged that it should not be open to Madras to disregard the law of prescription (*vide* letter from Colonel Bowen, R.E., to G. T. Walch, Esq., dated 20th July 1891). This will equally apply to Mysore. The proper construction of Rule III, as it now stands, is that the "existence and extent" of Madras rights should be determined in accordance with the law of prescription. Mysore object to this distributive reading of the rule. But that this is its natural construction and that that is how Mysore too read it is shown by the frame of the issues suggested by them before the Arbitration Committee (*vide* the terms attached to My. 1-*a*). The first issue proposed by them is "what is the quantity of water required . . . for the protection of the Madras Government's prescriptive right, etc., etc." The second is "in what fair and reasonable manner, according to the same Agreement should the supply due to Madras be regulated and measured in order to protect the prescriptive rights of Madras." This is just the sense in which Madras say that the Agreement should be interpreted. Otherwise it is not possible to see (and in spite of the arguments urged in Ma. 7, paragraph 7, Ma. 11, paragraph 4, Ma. 14, paragraph 23, Mysore have not shown) how any test of "fair and reasonable" is to be fitted into *the law of prescription* or the enquiry as to past user. The only relevant question for the

Reference-My. 12, paragraph 28.

Committee to consider is what has been the actual depth of flow claimed and taken by Madras in the past at the Akhanda Cauvery above the point of bifurcation.

6. As to the Madras claim to "the hot weather flow" (My. 12, paragraphs 11 to 16), Madras did not suggest that ordinarily the question of prescription would not arise also with reference to it; but in view of the previous correspondence and admission on the point, it was deemed unnecessary to consider the question with reference to the law of prescription.

Reference-My. 12, paragraphs 11 to 16.

Treating of the five phases which, Mysore allege, exhibit successive claims of Madras in the matter of hot weather discharge.

First phase.—Madras dealt quickly and tentatively with the Mysore project proposals, a very early reply having been specially asked by Mysore. Under these proposals the chief feature was the passing at Sivasamudram of a continuous flow all the year round for power of 1,000 cusecs.

In dealing with the matter it was assumed that the passing of this 1,000 cusecs was an integral part of the scheme to be dealt with and treated accordingly. In noting on the matter the year was therefore divided into two parts by the Special Superintending Engineer, *viz.*—

(1) The months in which all natural flow up to a certain limit was required for Madras irrigation.

(2) The months March, April and May in which all natural flow was allowed to be impounded by Mysore.

The Special Superintending Engineer erroneously recorded this as the months in which no irrigation water was required by Madras, but this note was made under the assumption that the passing down of 1,000 cusecs steady flow was assured by the Mysore project. *In addition to this* no irrigation water is required or claimed for the months March to May.

Second phase.—This is quite consistent with the above and with the proposals of the project now before the Arbitrators; but instead of 1,000 cusecs Madras have claimed a flow of not less than 900 cusecs in the hot weather to allow a fair working margin (Ma. 3, paragraphs 3 and 4). This claim was made in the belief that this was not a matter of controversy and as the passing of this flow was and is an integral part of the project under adjudication.

Third phase.—(Ma. 4, paragraphs 3 and 4). This was the claim put forward by Madras when Mysore repudiated any intention of guaranteeing this flow past Sivasamudram which forms one of the most important features of their project. In this the Madras Government say that in default of such guarantee they claim the whole "natural flow" of the river subject to the limit of flow at the Cauvery Dam which their rules provided for, *viz.*, that due to a seven feet gauge reading.

Fourth phase.—It may be here explained that throughout the proceedings the term "natural flow" has been used to describe the flow which under existing conditions would pass down the Cauvery. Thus "natural flow in the hot weather" and "natural flow *minus* the supply customarily drawn off the channels by Mysore for hot weather irrigation within their own territory" indicate precisely the same thing, but the latter term is a fuller description. The limit flow "L" million cubic feet per day (Ma. 10, paragraph 77) was inserted to represent whatever "limit flow" under the 2nd issue might be fixed by the Arbitrator and applied to the rules which form the subject of the 3rd issue.

Fifth phase.—Ma. 12, paragraph 99. The claim is exactly the same as the previous ones. In it the words "prior to the installation of power works" were inserted to make it clear that Madras recognised that Mysore had a right to the area of hot weather irrigation which was cultivated prior to installation of power works, which area has of late years been reduced in the interests of power. Under the above explanation it will be perfectly clear that on the Madras side there has been no change of attitude. As regards Mysore this is not so but quite the contrary:—

(*a*) Mysore put forward a project providing for passing throughout the hot weather a continuous steady flow of 1,000 cusecs past Sivasamudram which flow must pass down to Madras.

(*b*) On Madras claiming that a guarantee should be given that this flow, allowing a working margin, should not be interrupted or reduced, Mysore denied that Madras have any right to it. My. 4-3 (iv.)

(*c*) Madras explained that it is part of the Mysore project and that it is accepted by Madras as a set-off against the whole natural flow, which it is proposed to allow Mysore to impound, but that, if this steady supply is withdrawn, Madras must claim that in place of it the "natural flow" should be passed down (Ma. 4, paragraphs 3 and 4).

(*d*) Mysore admit the above claim (My. 7, paragraph 78) and on being asked before the Arbitrator to confirm this admission, the Mysore Representative stated it was already made in writing under the signature of a Secretary to Government and was fully admitted.

(*e*) Mysore unjustifiably substitute the term "average estimated flow" for "whole natural flow" (My. 9, paragraph 88). On being taxed with this, the Mysore representative asked for time to learn from his Government if this substitution is really meant.

(*f*) Mysore repudiate their admission and reproduce the word "average estimated natural flow" (My. 12, paragraphs 15 and 16). On being pressed with the enquiry as to what this term means, a written statement was promised defining it.

It is submitted that it is not Madras who have shifted their position in this respect but Mysore and by the Mysore admission Madras have been prejudiced in preparing the relevant evidence on this matter. Details regarding the hot weather irrigation have recently been called for, but the full information desired is not yet forthcoming. This is altogether due to the full admission by Mysore, My. 7, paragraph 78, which rendered evidence and discussion on this matter unnecessary; this admission being subsequently repudiated, the enquiries for full available statistics as regards this matter have only lately been undertaken and are not yet fully available. Meanwhile a statement of second crop and perennial area of irrigation in the channels above the Upper Anicut is given in Madras Exhibit Ma. 15 (*a*).

PART XII.—FACTS AND ENGINEERING ARGUMENTS—SECOND ISSUE.

7. The statement of Mysore that "mere flow as such" was not demanded by Madras in the case of the Marikanave project in the note of the Chief Engineer for Irrigation No. 58-I. of 17th March 1882 (My. 11) is not in accordance with fact. In paragraph 4 of the note, a stage flow at Sunkasala and Bezwada Anicuts is taken as the limit of natural flow required before impounding could be permitted. This condition is preceded by a statement of areas irrigated, but the nature of the condition is specifically based on *mere flow*.

Reference-Mysore, paragraph 29.

8. The interpretation of clause (*b*) of the second issue advanced by Madras (Part VIII, paragraph 18, Ma. 14) is adhered to.

Reference-Mysore, paragraph 30.

9. Considerable sums have been spent in the last 20 years on general improvements of the channels and systems and on replacing open cuts in channel banks giving unregulated supply by pipe sluices, and the general development of control has resulted in more economical use of water, and in gradual extensions of irrigation. Neither the extent nor mode of user as regards water taken has, however, been altered or increased.

Reference-Mysore, paragraph 32.

10. As regards the area irrigated under the Veeranam tank and the Vadavar, it is not very clear in what respect the differences of area quoted are material to consideration of the case.

Reference-Mysore, paragraph 33.

It is common ground that the total area irrigated under the Lower Anicut system has not materially changed for many years and is accepted by Mysore at 112,000 acres (My. 9, paragraph 18).

The figures given by Madras as to the area under Veeranam tank and the Vadavar (Ma. 8, paragraph 37), were furnished by the Superintending Engineer and appear to have been extracted from G. O. No. 944-I., dated 1st September 1906, which sanctioned the estimate for raising the level of the Veeranam tank as they agree with the figures there given.

The figures given in G. O. No. 400-I., dated 24th September 1909, are re-quoted below in detail.

This Government Order is the report on the closure of the construction estimate of the Lower Coleroon Anicut system.

The extract of that part of the Government Order bearing on the matter is reproduced in Appendix XXVI. This is a brief description of the irrigation conditions of the Lower Anicut system and distribution of irrigation. It will be seen from this description that the total area is made up as below:—

	ACS.	ACS.
North side—		
Vadavar	11,066	
Veeranam tank	45,159	
Khan Sahib's canal	12,946	
Ponneri tank	3,284	
North Rajan voikal	20,252	
		92,707
South side—		
South Rajan voikal	17,027	
Kumukumanniar	1,280	
		18,307
Grand Total ...		111,014

The sources of supply to Khan Sahib's canal are water passed through the south surplus sluices of Veeranam tank and the drainage and surplus water of lands under the Vadavar. One branch of the Khan Sahib's canal (the Govarapathu channel) gets a supply from the North Rajan voikal when there is deficient supply in the Khan Sahib's canal and thus has an outside source of supply. Under this description it is clear that the Veeranam tank and the Vadavar are the sources under which the greater part of the area under Khan Sahib's canal is supplied with water. It is a difficult point to decide what area is irrigated under each of the three main sources of supply, *viz.*, the Veeranam tank, the Vadavar and the North Rajan voikal. It is submitted that, as the total area is undisputed, the matter is not a material one to the investigation.

The references made to the Collector of South Arcot as regards the area irrigated under the Veeranam tank have not been fully replied to as the accounts recording the sources of supply to each area are not kept and it has been necessary to institute enquiries in each village. Under the description given in Appendix XXVI, it will be realised that the source of supply to the area under Khan Sahib's canal is a mixed one and no return from the Revenue Department could settle the original source of supply of this area. It is submitted again that the total area not being in dispute the uncertainty as regards sources need not be pursued further.

Requirements—Cauvery Delta System.

11. The necessity of scour has been fully admitted and indeed insisted on by both parties, and Madras contend that the rules of 1882 show a clear right to a limit flow whenever available not less than that due to a 6½ feet flow over the dam with the under-sluices fully open under the conditions which obtained during the currency of these rules.

Reference-Mysore, paragraph 37.

The necessity of scour still continues, but since remodelling and for some years (*i.e.*, since 1896) prior to remodelling, the limit gauge at which scour was permitted was raised to seven feet.

This did not mean that the necessity of water for scour had ceased or altered, or has now ceased, but merely that later opinion was that, under the conditions existing in 1896, the seven feet rule provided for a more judicious distribution of the water than the rule of 1882. Scour is still as necessary as ever. Redistribution of the water available was then, and is still, an existing and prescriptive right.

Under the now existing conditions, it is possible to allocate sufficient water for scour, which water also supplies the Lower Anicut system, and maintain seven feet on the Cauvery Dam when the flow in the Agunda Cauvery is the same as it was prior to remodelling with 6½ feet gauge and the under-sluices open. Thus, for the same flow as would formerly have given a gauge reading of 6½ feet with scour, or seven feet without scour, we can under existing circumstances maintain seven feet with scour water, and this amount of water is fully established as the limit flow by the rules of 1882, 1896 and 1906. This quantity is, it is claimed under the most restricted reasonable reading of the rules of 1882, supported by the record of actual user under those rules, the lowest limit flow which can be adjudged according to law as the prescriptive right of Madras for the supply of the Cauvery delta system.

Mysore contend that the delay of opening till 6½ feet gauge was realised was only made because, with the same flow, the full opening of under-sluices at 6½ feet would have caused water to drop to 6 feet. Assuming, by way of argument, that the Mysore contention is correct, the discharge with 6 feet on the Cauvery Dam with the under-sluices open prior to remodelling was 2,380 million cubic feet and this is more than the discharge due to seven feet on the Cauvery Dam under the conditions now existing.

Mysore thus admit that this water is the least prescriptive right of Madras.

Mysore now argue that, as under-sluices were never opened with six feet on the Cauvery Dam, therefore, the Madras contention above is unsustainable. It is futile to argue that 6½ feet gauge is only required because scouring will reduce the level to six feet, and that at six feet no scouring is allowable.

It is claimed that even under the contentions of Mysore the limit flow due to Madras under the rules of 1882 for the Cauvery delta is 2,380 million cubit feet per day, the amount due to six feet gauge with under-sluices open. Under the Madras contention it is 2,944 million cubic feet per day which is the amount due to 6½ feet with the under-sluices open, or seven feet with under-sluices closed.

12. Mr. Larminie never contended that six feet was the maximum useful flow, but that it was the limit below which no impounding should be permitted even for a reservoir which aimed at maintaining a steady and secured flow at the Upper Anicut. The argument in Ma. 12, paragraph 40, deals further with this matter.

Reference-Mysore, paragraph 38.

13. Useful limits do not change from year to year. It is only after full control of distribution was possible, that the actual incidence of control can show the intentional distribution of water for purposes of actual use.

Reference-Mysore, paragraph 39.

Prior to acquiring control, evidence of actual use of water passing is open to the imputation that the water passed involuntarily and as a necessity of the case.

This is not the case in the Cauvery and Vennar after 1902 except on the days actually specified in Appendix XVIII, Ma. 12.

14. There is no difficulty in regulating the Cauvery and Vennar so as to avoid a head on the regulators of more than 4½ feet and no delay is necessary in regulating to secure this. There is never any attempt made to adjust gauge readings to secure a head of 4½ feet, the rules of regulation allow *any head not exceeding the named figure.* The statement of Mysore here made is altogether denied.

Reference-Mysore, paragraph 40.

15. Mysore here admit the Madras argument as a good one provided there is an establishment sufficiently intelligent to carry it out. The ordinary establishment is sufficiently intelligent to carry out such a direction, and this is proved by the fact that this very direction is now part of the rules in force with a view to maintain seven feet

Reference-Mysore, paragraph 41.

gauge reading—*vide* Rule of 1905 for regulation at Upper Anicut, Appendix I (Ma. 8), which runs—

"The normal supply level for the Cauvery delta is seven feet on the Cauvery Dam and this level should be maintained as long as possible by raising and lowering the anicut shutters."

If six feet were read for seven feet and under-sluices for shutters, this rule would be the rule which should have been formulated in 1882 to provide for the efficient regulation if the contentions of Mysore were correct. The class of establishment employed is now the same as that employed in 1882 and the rule requires no specially intelligent staff to carry it out. There is no difficulty whatever in regulating according to such a rule.

Reference-Mysore, paragraph 42.

16. This is answered in paragraph 11.

Reference-Mysore, paragraph 43.

17. The question to be decided is not what would be the state of affairs under the provisions made in the Metur Reservoir Project, but what are the existing rights of Madras.

Reference-Mysore, paragraph 45.

18. Madras paragraph 53 (Ma. 14) which is stated to "have been answered above" has not been so answered at all.

The only paragraph "above" which alludes to the regulation of the Cauvery and Vennar regulators is paragraph 40, and this does not meet or reply to the Madras contentions in paragraph 53. The Madras arguments in paragraph 53 are not in any way a repetition of those in paragraphs 43 and 44 (Ma. 14) as stated by Mysore; indeed 43 refers to the Upper Anicut and not to the Grand Anicut.

The contentions of Madras paragraph 53 have not been met by Mysore.

Reference-Mysore, paragraph 46.

19. Here it is claimed by Mysore that the arguments of paragraph 54 (Ma. 14) have been met in the reply to Madras paragraph 44 (Ma. 14) which is answered in paragraph 40 (My. 12). This paragraph does not in any way reply to the Madras paragraph 54. The challenge to give some proof or specific statement of the general proposition that Cauvery and Vennar regulators are used constantly for flood disposal is not met at all. Paragraph 40, My. 12, is a general statement about the intelligence of the regulating staff, and the opinions of hydraulic engineers, both of which are denied and neither of which is relevant to the present paragraph (paragraph 54, Ma. 14).

Reference-Mysore, paragraph 47.

20. The question at issue here is as regards the rules of 1902 for regulation of the Cauvery and Vennar regulators (Ma. 8, Appendix I). By inadvertence the original Mysore contention on this subject (paragraph 41, My. 9) was replied to with reference to the rules of 1892 (paragraph 55, Ma. 14). The Mysore contention is that the allowances noted as full supply, *viz.*, 4½ feet on Cauvery and eight feet on Vennar rear gauge, were only given on account of turns.

Turns are only resorted to in times when the supply by other means is too small to give efficient supplies to the area.

The rules referring to "Regulation in non-flood season" only apply to stages of river flow not greater than 4½ feet Cauvery and eight feet Vennar. The last two clauses of the rules apply to these stages of flow only and for regulation at all other stages of flow the previous rules only apply, and to those only one must look to see what are the limits below which no surplusing through the Grand Anicut is permitted. These limits are 6·2 in the Cauvery and eight feet in the Vennar.

Reference-Mysore, paragraph 48.

21. The argument of Mysore is "that six feet must have been the full supply limit prior to remodelling, considering that facilities have been afforded for forcing extra supplies after remodelling." This refers to the limit gauge at the Cauvery Dam.

This statement is made to rebut the statement of Madras that even accepting for purposes of argument the 4½ feet rear gauge Cauvery regulator and seven feet gauge Vennar regulator, as being the full useful supply, that this is equivalent to 6·6 feet on the Cauvery Dam.

The "argument" of Mysore does not in any way meet or rebut the proposition.

22. The Madras Government have never suggested that *complete exclusion* of floods in excess of the requirements of irrigation was either practicable or practised. Their contention has been that under existing conditions the admission of water through the Cauvery and Vennar regulators for the purpose of flood disposal was infrequent and they have given a statement (Appendix XVIII, Ma. 12) of the occasions on which such floods have been admitted, which are very few.

Reference-Mysore, paragraph 49.

The reply of Mysore in no way rebuts the Madras contentions (paragraph 57 Ma. 14). This paragraph of Mysore does not deal with or reply to Madras paragraph 58, although it claims to do so.

23. Madras state that the only possible object of the dam stones on the Grand Anicut was to force water in excess of 4·67 feet down the Cauvery at that work, while from all other considerations the existance of the dam stones was certainly very objectionable.

Reference-Mysore, paragraph 50.

They contend that this is absolute proof of the then existing necessity for irrigation water up to a limit of 6·67 feet in the Cauvery.

Mysore do not attempt to deny or rebut this but in reply state that—

Firstly, a gauge reading of 6·67 feet connotes a discharge of 30,000 cusecs Major Oakes stated the discharge was 23,650 cusecs. Madras do not claim that 6·67 is always required, but produce absolute proof of its being intentionally forced down the Cauvery for purposes of irrigation when Major Oakes was writing.

Secondly, Mysore state that 26,680 cusecs (the equivalent of seven feet on the Cauvery Dam) is the limit of Madras claim for Cauvery and Vennar.

This is not a fact.

Madras have stated several times (paragraph 56, Ma. 14 and other places) that the limit of occasional useful supply is 7½ feet and even more on the Cauvery Dam and that while seven feet represents the limit ordinarily passed whenever received for the irrigation of the Cauvery delta, that occasional extra quantities are required and actually passed.

24. It is quite possible that the provisions made for the supplies to be passed in June provided in the Metur Project might prove inadequate, but the miscalculations of such supplies could not inflict any permanent deprivation on Madras because they would be impounded in the interests of, and at the call of, the same area.

Reference-Mysore, paragraph 52.

Madras have never claimed that their requirements for June were the same as for July and August; under the incidence of natural flow up to the limit of Madras claim the quantity of water passing in June is without exception far less than in July and August. What is claimed by Madras is the natural flow for June up to this limit, and they contend that that flow is ordinarily used under existing conditions and has been so used for many years past.

25. This is a general statement and does not call for any reply. It is also considered irrelevant to the issue under consideration.

Reference-Mysore, paragraph 54.

26. The figures in column 7, Appendix XXIV, are not exclusive of the quantities of drainage passed into the sea. This matter of drainage water has been dealt with (Ma. 14, paragraph 73). It is denied that the figures are necessarily high on account of the admission of water for disposal of floods. The reitirated general statements of Mysore to this effect have not been supported by any specific proof, and while the denial of Madras is supported by proofs, and statements of facts the accuracy of which has been altogether unchallenged by the other side.

Reference-Mysore, paragraph 55.

The figures in column 5 (Appendix XXIV, Ma. 14) which represent the quantities due to Mysore limits at Cauvery Dam when compared with column 10, the quantities which Mysore advance as due at Cauvery-Vennar regulators, fail to give this supply in seven years out of twenty, and thus making no allowance for the supply of the Lower Coleroon system, or for ordinary absorption and draw-off between the Cauvery Dam and the regulators, even on their own arguments.

Mysore rules give altogether inadequate supplies for the *Cauvery delta system alone.*

27. The time when losses in transmission occur between the Cauvery Dam and the Grand Anicut is when there is little local rain. There is an anicut across the Kodamuruti river taking off the low flow of that river and such flow does not come into the Cauvery at all. The losses in transmission by seepage, percolation and surplus into the Coleroon, as also by draw-off and ordinary absorption, are considerable between the Upper Anicut and the Grand Anicut and are not by any means made good by the Kodamuruti except after good rainfall in the catchment.

Reference-Mysore, paragraph 56.

28. The reasons why there must be a material quantity of drainage from the delta lands are stated in Ma. 14, paragraph 73, and the necessity for change of water is admitted by Mysore. The discharges shown in column 7, Appendix XXIV, Ma. 14, include the water occasionally passed for flood disposal. These are not the figures put forward as what has been passed with intention for purposes of supply except after 1905-1906. The quantities passed for supply up to that year are shown in column 8 of the table. It is not suggested that on years of well-maintained abundant supply the crops would have suffered if given less water but the rules are framed with a view to ordinary conditions. In good years, the crops get more than is absolutely necessary, and in bad years they suffer from want of water.

Reference-Mysore, paragraph 57.

29. As regards the Madras Triennial* Report, 1901-1902, the remark made is materially correct, taken, as it was made, if as a general statement not specially applied to any year or to the Cauvery delta system. The remark was made in the form of notes on the Godavari system but is applicable to the whole Madras Presidency.

*Triennial Report, 1901-1902, Godavari delta system, page 8, paragraph 8.

30. The Mysore admission here is that 72 inches is allowed per acre in Mysore *exclusive of rainfall* which may be taken as 25 inches in addition, and is also the allowance with reference to *a controlled supply*. In applying this figure to Madras, Mysore, however, proceeded to deduct rainfall and to apply it to an uncontrolled and very fluctuating supply.

Reference-Mysore, paragraph 58.

The explanation of Mysore as to the source of the 72 inches puts them in a worse position than before.

The allowance of 72 inches delivered on the fields if from a controlled supply and delivered as required has been stated by Madras to be adequate and this is adhered to.

The Mysore contention that *above the fields* means at the Cauvery Dam is quite unreasonable.

31. The figure 190,000 million cubic feet quoted by Madras was from the Metur Project, Vol. I, paragraph 56.

Reference-Mysore, paragraphs 59 and 60.

This is the requirement for an assured and controlled supply under a reservoir. Adding to this 30 per cent, which is what Mysore at one time suggested and which cannot be maintained to be an unreasonable allowance for the fluctuating nature of flow, the total becomes 247,000 million cubic feet, and this supply given with normal incidences as regards fluctuation and seasonal flow is a rough indication of the flow at the Cauvery Dam required to secure the Delta irrigation. Compare this with the figures in column 3, Appendix XXIV, and it will be seen that this supply connotes a limit gauge of about seven feet, except in the bad years when the delta has suffered from deficient supplies.

32 The Mysore argument here is not clear. Under no circumstances could the Mysore Project lead to reducing the remissions or losses in Madras which, under existing conditions, must be granted. The possible effect is absolutely confined to the opposite result.

Reference-Mysore, paragraph 61.

33. The rules of 1882 do not restrict their operation to any special months of the year and it is on the basis of these rules that Mysore admit the six feet limit. The modes of user under the rules was applied in the past and is still applied without any difference in working throughout the irrigation season.

Reference-Mysore paragraph 62.

34. Madras adhere to the views already expressed in Ma. 14, paragraph 82, and previously.

Reference-Mysore, paragraph 63.

Lower Coleroon System.

35. The first suggestion made in this paragraph is that the whole average run-off from the catchment area, 1,077 square miles, draining into the Coleroon between the Upper and Lower Anicuts, is absorbed into the river bed by seepage immediately it is received in the river, and is stored and given out gradually.

Reference-Mysore, paragraph 64.

It is suggested that the capacity of the river-bed available for effective subsoil storage is 12,924 million cubic feet. Further, it is suggested that, in addition to this, 12,250 million cubic feet from floods coming from the Upper river will be stored annually in the river-bed and given out gradually as required for irrigation. Taking the whole content of the Coleroon river-bed for a depth of 2 feet and width of 2,000 feet as available for storage, the total content for the length of 70 miles between the Upper and Lower Anicuts will be $(2 \times 70 \times 5,280 \times 2,000) \times \frac{1}{3} = 493$ million cubic feet. This is according to Madras basis of computation (paragraph 50, Ma. 12). Mysore computation (Ma. 9, paragraph 50) gives the storage capacity of the whole river from Kannambadi to the Upper Anicut (250 miles) as 583 million cubic feet. Yet here it is suggested that the storage of 70 miles is 12,924 million cubic feet. The propositions made are altogether extravagant and fanciful and the statements made are altogether denied.

36. The statement here made is denied. This is merely a repetition and has been dealt with in paragraph 11 (Ma. 12) and elsewhere.

Reference-Mysore, paragraph 65.

37. The Madras contentions are not incorrect as regards the facts shown in tables K and K-1. Of the irrigation under the Lower Anicut system the area under the Vadavar and Veeranam tank comprises more than one half. The tables show that, in the bad years for which the tables are drawn, the supplies passed down the Vadavar have been very inadequate for the areas commanded and further that the flow in the Vadavar dwindles to a very inadequate one immediately specific supplies from the Cauvery cease and *vice versa*.

Reference-Mysore, paragraph 66.

It has been suggested that these figures of supplies are unreliable because such inadequate supplies must have resulted in failure of crop.

In years when supplies from the Coleroon are inadequate, the areas planted in the earlier part of the year are small, and the back of the area is planted late ; the course of cultivation has to be adapted to the character of the season. When a crop fails in the early part of the season, the area is generally replanted. It is only when no crop has been raised from circumstances not in the control of the ryot that remission is given. The value of the crop, however, depends much on the period it stands on the fields. Six months paddy is more valuable than five months paddy and the former much more valuable than a three months crop.

The nature of the crop put in is varied in accordance with the month of planting. The absence of flow in the Vadavar and of supplies to Veeranam tank in the south-west monsoon may not greatly affect the total area of paddy on which assessment has to be paid, but it greatly affects the value and quantity of the yield, and the season of planting out the crop.

The building of the Lower Anicut and the alterations which have been made in this work have been chiefly in view to the more effective supply of the Vadavar and Veeranam tank, and it is submitted that it is by flow in the Vadavar that the character of the supplies passed must be chiefly gauged. The other channels are

generally well supplied and it is the supply of the Vadavar that is the measure of the adequacy or otherwise of the supplies to the Lower Anicut system.

It is submitted Madras rightly considered the figures in column 11 and column 6 in Appendix K-1 in considering the effect of inflow from the Cauvery on the irrigation supplies of the Lower Anicut system.

The figures in column 11 are liable to far less inaccuracy than those in column 10, the former being the component of many discharges nearly all of which are known to be unreliable, while the latter is the deduction of the flow from a single gauge reading not subject to variation by regulation.

The figures in Appendix K-1, it is submitted, clearly show in form of flow in the Vadavar the value and necessity of actual supplies passed from the Cauvery to the Lower Coleroon irrigation system and the way in which the former responds to the increase and diminution of the latter.

38. It is obvious that, when every source of supply is closed down, the remaining flow of the Coleroon must all be obtained from seepage, leakage and run-off from rainfall. It was understood that when Mysore said, in paragraph 77, My. 9, the supply in the Coleroon was maintained, the suggestion was that *adequate supplies for irrigation were maintained*. It is noted that Mysore deny the intention of making any such suggestion. Under these circumstances, it is not clear what Mysore contention was.

Reference-Mysore, paragraph 67.

It is suggested by Mysore that *minus* figures should not be considered, and also that these are not lost but given out again on another day. Surely, this implies that they should be considered, and that the *plus* figures on one day may be the output from the *minus* figures of another; thus the totals should be the algebraic sum of both as shown by Madras in Madras Appendix XXV and paragraph 90, Ma. 14. It is to be noted that the figures of discharges of the Lower Anicut are not reliable and inaccuracy and unreliability in many cases have been clearly proved and are not denied by Mysore. Exact computations cannot be reasonably based on such figures. The above general arguments with regard to Mysore contentions based on these figures are, however, submitted for consideration.

39. Mysore here argue, that because the quantities of water passed down to Vadavar in the bad years for which the tables Appendix K-l are drawn are quite inadequate for the supply of the area irrigated under the Vadavar and Veeranam tank, therefore the help which Veeranam tank gets from the Vadavar is insignificant. In these years supplies were abnormally bad and the resulting outturn of crop suffered in consequence. It is quite impossible that Veeranam tank could supply an area of 52,000 acres or anything like it from its own catchment. The capacity of the tank is such as only to be able to hold some 12 days' supply for its ayacut. The catchment area even according to Mysore calculation is only sufficient for 30,000 acres (My. 7, paragraph 72) and this is on a computation of the yield of the catchment without considering the very inadequate capacity of the tank. Even under this extreme calculation Mysore admit in the same paragraph that 22,000 acres under the tank require to be altogether supplied from the Vadavar and say it can easily get its supply from it. Now it is contended that the supply required from the Vadavar is so insignificant as to be not worth considering.

Reference-Mysore, paragraphs 68 and 69.

Madras computations regarding the irrigating capabilities of the Veeranam tank apart from the Vadavar are given in Ma. 12, paragraph 92.

It was chiefly for the feeding of the Vadavar that the Lower Anicut was first constructed in its present site. It was solely for the supply of the Vadavar that the level of the top of the shutters was raised two feet over the old solid crest level when remodelling the anicut in 1900 to 1902.

The supplies of the Vadavar are essential to the prosperity of the Lower Anicut system. The Mysore tables, Appendix K-1, show that in bad years the supplies are very restricted and argue that under circumstances which cause great diminution to these supplies the irrigation will get on quite as well because under the restricted supplies the remissions have not been great. The inadequacy of the supplies is patent and surely conditions which cause any diminution of the same cannot be regarded as safeguarding the prescriptive rights of Madras.

It is noted that Mysore admit that the demand originally made by Madras (Ma. 1) for the specific supply of the Lower Coleroon Anicut system of a limit supply of 66 million cubic feet in 24 hours in addition to the limit gauge reading of 7 feet at the Cauvery Dam was a small one.

Reference-Mysore, paragraph 70.

40. Madras have never suggested that the area under the Veeranam tank was wholly dependant on Coleroon water and have stated that during the north-east monsoon the supplies are chiefly derived from the catchment of the tank.

In years of bad supplies from the Coleroon, cultivation begins late and the yield of the ayacut suffers both in the matter of the quality and quantity of the paddy raised.

Because a crop of four months paddy is raised in a year of deficient Coleroon supply over most of the irrigated area, this is no reason why such occasional deficiency should be increased by the action of Mysore.

Reference-Mysore, paragraph 71.

41. The argument here used by Mysore is that because in 1899 water was involuntarily surplused at the Lower Anicut there is no reason to apprehend that even in the worst year Mysore reservoir will reduce the floods in a way prejudicial to the Lower Anicut system. The argument is not understood. Every flood helps to supply the Coleroon system both directly and by seepage and any diminution of flood necessarily reduces supplies.

The statement that in 1899 the Madras computation of floods at the Upper Anicut is under-estimated is denied. It is high floods which may be under-estimated by Madras. There were no high floods in 1899, the maximum gauge reading of the year being 8·8 and the gauge of the Cauvery Dam was over 8 feet on only eight days throughout the year.

The necessity of surplus over the Lower Anicut is a recognised necessity, and Madras do not contend that Mysore should not be allowed to impound under any circumstances which appears to be the contentions of Mysore in the last clause of the paragraph under reply. It would have been open to Mysore to impound in 1899 under the conditions proposed by Madras a material quantity of the surplus referred to.

Hot Weather Flow.

Reference-Mysore, paragraph 72.

42. Until the sitting of this Arbitration Committee, there was never any question as regards the hot weather flow between Mysore and Madras.

The Mysore Project provided as an integral part of the project for the passing of a steady flow of 1,000 cusecs from Sivasamudram and the Madras Government taking this into consideration waived their rights to the natural flow of which they were in enjoyment, and stated that they would agree for the purposes of this project to the impounding by Mysore of the whole natural flow of the river during March, April and May. What was before the Government of Madras during all the discussions and correspondence was the conditions of the Mysore project which conditions involved the invariable passing for power of 1,000 cusecs and it was under such conditions that Madras assented to impounding by Mysore in March, April and May.

This assent was given because it was considered that, under the conditions above, such a change would not be injurious to Madras.

A steady flow of 900 cusecs was claimed by Madras only as a set-off against the then existing right to the whole natural hot weather flow of which they have present enjoyment.

Reference-Mysore, paragraph 73.

43. The expression "the whole natural flow" used by Madras has always been subject to the understood limit flow of 7 feet at the Cauvery Dam. The matter of hot weather flow has not been closely examined as it was believed that on this matter both sides were agreed and because it was admitted by Mysore (paragraph 78, My. 7) that Madras "are only entitled to the natural flow of the river after the

customary Mysore requirements are satisfied." It was after discussion asserted by the Mysore Representative that this admission was intentional and no reservation was made. Mysore have now gone back on this and claim to have a limit flow fixed, above which impounding may be allowed.

Under these circumstances, it is necessary to examine the records available of the flow of the Cauvery in the hot weather months, March, April and May. The records of daily flow at Sivasamudram are available with Madras only from 1902 to 1908. This flow was computed under the directions of the Assessor (Exhibit A-5).

The flow daily at Bhavani Bridge is available for discharges of 1,000 cusecs and upwards but is not available for days of lower discharge.

A table has been prepared, Appendix XXVII, showing for months, March to May, the daily discharges at Sivasamudram and such discharges as are recorded at Bhavani Bridge three days later for the above years.

Another statement shows for the years 1891 to 1901 for these months the recorded discharges on any day at Bhavani Bridge when in excess of 1,000 cusecs.

Another statement in the same Appendix shows the number of days in each month that a discharge in excess of 1,000 cusecs passed Bhavani Bridge in March, April and May for the twenty years, 1891 to 1910, and in each case the average discharge and maximum discharge during those days.

The hot weather flow of the Cauvery is to a great extent dependent on the seepage from its sides and bed and from the seepage of its tributary streams. Every fresh or rise of flow causes the replenishments of the stores of water held in the river bed to be gradually given out as the water falls.

In March, the flow of the river is fed principally by seepage from the stores of the last floods. Any material rise in March is rare.

In April, there are thunderstorms which reinforce the supplies causing occasional small freshes of which a large proportion is absorbed in the river bed and have the result of increasing for days and weeks succeeding the hot weather flow from seepage.

In May, there is frequently a good deal of rain in the hills of Coorg and adjacent parts and a distinct increase of flow to the Cauvery results.

These April and May rises are of the greatest importance in replenishing supplies while the latter also serve for contributing to filling up the river bed and so paving the way for the transmission of the June freshes.

In considering the limit of flow which is useful to Madras in this period, it is considered that all intermediate freshes react on the succeeding river flow and provide more water for the river channels. If, however, a fresh comes down of such magnitude as will wash away the *koramboos* at the heads of the channels, its usefulness in replenishing supplies will be more than counterbalanced by the harm it does to *koramboos*. Under these circumstances, the limit of useful flow is what will not disturb the *koramboos*. The stage of flow at which there is danger to *koramboos* is about 600 million cubic feet per 24 hours.

There is a lot of loss in transmission by absorption in April and May between Sivasamudram and Bhavani Bridge while there is much additional loss between this and the heads of the principal irrigation channels which require supply, most of which take-off below the confluence of the Amaravati. In view of this, it is considered that the limit of natural flow which must be passed on by Mysore to Madras to preserve Madras rights unimpaired should be 800 million cubic feet in 24 hours, say 9,000 cusecs measured at Sivasamudram.

This point is not directly involved in considering the Mysore project as at present advanced, but if it is considered that the Arbitrator should adjudicate on this point the claim of the Madras Government is to the whole natural hot weather flow up to a limit of 9,000 cusecs at Sivasamudram. In the alternative, the Government of Madras are prepared to waive their existing rights as above formulated for the months of March, April and May in consideration of a continuous flow never less than 900 cusecs being passed down to them from Sivasamudram throughout this period.

44. The statement made by the Special Superintending Engineer in paragraph 2 of his note of 15th November 1910 is certainly a wrong one.

Reference-Mysore, paragraph 74.

The note in which this officer reviewed the conditions of a Mysore Reservoir was drawn up very hastily between 7th November and 15th November and in it the assumptions made as a basis of working are stated. The assumption made by the Special Superintending Engineer (Colonel Ellis) for the purpose of drawing up working tables was correct as it was known to him, when writing, that 1,000 cusecs was to be passed for power and that this supply must be passed steadily to Madras. Under the circumstances, it is submitted that the statement made by Colonel Ellis that the year was divided into two periods and that March, April and May was classed as the period of the year in which there is no demand for irrigation water cannot be adduced as any proof that this was so.

As a fact Colonel Ellis was not aware, when he wrote, that the Cauvery channels required water after February, and it was only, when the enquiry in respect of the present proceedings was made that the actual requirements of these channels became known to him.

If Mysore rely on the Special Superintending Engineer's memorandum as proof of their contention, they should put it in.

45. The time available since December when it was first understood that the Mysore Durbar repudiated their admission that Madras rights extended to the whole hot weather flow of the Cauvery subject to the customary draw-off by Mysore channels has not been sufficient to get as full detail of the Cauvery irrigation in the hot weather months as is desirable and further enquiry is being made.

Reference-Mysore, paragraph 75 and Mysore note, dated 28th Jan. 1914, on "average estimated natural flow."

A statement is, however, printed [Appendix XXVIII] giving the areas reported by the Collector of Trichinopoly to require water in the months of February, March, April and May in a normal year.

The areas of hot weather irrigation (March to May) in other affected districts are small and do not materially affect the question. The area of hot weather crop will vary with the character of the season and all the water passing down the Cauvery at this season is usually utilised for diversion into the channel heads by means of *koramboos*. There is much leakage through the *koramboos*, and the greater the amount and depth of hot weather flow the more abundant the supplies to the hot weather irrigation up to the limits of flow named in paragraph 43. In the month of May, most of the rise in the river, which generally occurs, is absorbed on the bed of the Cauvery and serves to prepare the river bed for passing down the more abundant flow of June.

It has been represented by Mysore that a flow as low as 90 cusecs has been recorded at Sivasamudram. This is the minimum flow ever recorded. The average flow of the lowest flow month is 433 cusecs on the computation furnished by Mysore.

The existing system of hot weather irrigation in Madras is one which normally uses the whole natural flow during the hot weather months.

For the large Wyyacondan channel, the *koramboo* is actually carried right across the river and this practice is a proof of use of the whole normal hot weather flow.

A fresh not exceeding 9,000 cusecs in the upper river would be reduced to very small dimensions before reaching the Upper Anicut and would serve to reinforce and increase the river flow for many days after. It is submitted that during the hot weather all freshes are normally useful to, and used by, Madras up to the limit flow claimed.

46. The Mysore revised statement of the Madras rights for hot weather flow is that these rights extend to the "average estimated natural flow" This is shown by Mysore as being (at Sivasamudram) as under:—

		CUSECS
February	First-half	1,219
	Second-half	855
March	First-half	615
	Second-half	433
April	First-half	440
	Second-half	639
May	First-half	989
	Second-half	3,925

Under the Mysore admission Madras are entitled to this average flow (My. 12, paragraph 16).

Mysore, however, now explain that in place of this they suggest Madras should be allowed in each half-monthly period natural flow limited to 900 cusecs or to the above average flow whichever is less.

Mysore compute 600 cusecs as being required as a steady supply for Madras hot weather irrigation and yet propose to *limit* the flow to natural flow subject to a maximum of 450 cusecs for one month and somewhat higher, but absurdly inadequate, limits in other months. The hot weather irrigation duty is taken by Mysore as 100 acres per cusec, which is counting water as $2\frac{1}{2}$ times as efficient in the hot weather as at other times.

Under the existing conditions of natural flow the Madras irrigation normally uses the whole natural flow of the Cauvery in the hot weather, and it is submitted that within the limit claimed such flow is useful in the months of March, April and May.

In the month of February, water is also required whenever available for the Cauvery Delta system and is used for this up to the full extent received under conditions of natural flow.

47. It is submitted that during the months, February to May, Madras actually make use of the full natural flow of the river and that in order to fully safeguard the rights of Madras *the natural flow past Kannambadi up to a limit of 9,000 cusecs* must continue to be passed.

In the alternative, Madras will agree to allow Mysore to impound the whole natural flow of March, April and May subject to an undertaking to pass down from Sivasamudram a continuous flow never less than 900 cusecs during this period. This condition is an integral and necessary concomitant of the working of the project now the subject of this arbitration.

As regards the month of February, water is required during this month both for the channels above and below the Upper Anicut, that is, for the Cauvery Delta and the Madras Government are not prepared to take during this month a continuous flow of 900 cusecs as a set-off against the natural flow to which they are entitled.

Cauvery Channels above the Upper Anicut.

48. If the 7 feet limit which is passed for delta irrigation under existing rules at the Upper Anicut is not interfered with, the requirements of the upper channels on the Cauvery will be automatically met.

Reference-Mysore, paragraph 76.

49. The construction of a reservoir on the Bhavani about which Mr. Hughes reported, only entailed abstraction from the Cauvery total flow of a small proportion of the total natural flow, estimated by Mr. Hughes as 15 per cent. Mr. Hughes' proposals for the Bhavani project were not to impound all flow exceeding 4·8 on the Cauvery Dam, but to impound to 15 per cent. of the whole flow whenever the *natural flow* at the Cauvery Dam was 5 feet or over. This would reduce a natural flow of 5 feet to 4·8 feet, and this, and not 4¼ feet as stated by Mysore, was Mr. Hughes' limit.

Reference-Mysore, paragraphs 77 and 78.

Under such a rule a natural flow of 7 feet would be reduced to 6½ feet and so on and this is a very different proposal from limiting flow to 4·8 feet. While this proposal would have had some injurious effect on the supply of the upper channels, it would never have affected river levels by more than about 6 inches and generally by less than this, and would not have involved anything like the paralysing effect which the restriction of flow to a 4½ feet gauge would entail.

Mysore have apparently not clearly understood the conditions of impounding involved in a Bhavani project and thus have not clearly represented this matter.

Reference-Mysore, paragraph 79.

50. Mr. Larminie repudiated Mr. Hughes' proposal even under the limitations involved by the reservoir on the smaller river, but suggested a reservoir on the Cauvery to maintain 6 feet on the Cauvery Dam as a steady flow, all through the irrigation season (*vide* Ma. 16, Mr. Larminie's report, paragraph 49, printed with Part VI Proceedings).

With a steady flow of 6 feet throughout the irrigation season an adequate supply to the upper channels could, as a fact, be secured, as this would enable supplies from half a foot to one foot below full supplies to be steadily passed into the channels.

Colonel Smart generally agreed with Mr. Larminie, but to ensure adequate supplies to the Delta provided for a 6½ feet standard.

It is to be remembered that the above standards were for steady flow.

There is nothing in the reports to show that these officers considered that the necessities of command and river stage in connection with the upper channels, but Mr. Larminie and Colonel Smart's proposals would not have injuriously affected them subject to the maintenance of the steady supply contemplated.

Mr. Hughes' proposals would have affected the supply of the channels probably to an extent of 10 to 15 per cent of their supply. It is possible that Mr. Hughes who considered these channels and allowed for them as regards *quantity* overlooked the necessities of command, but nothing is recorded about this.

Reference-Mysore, paragraph 80.

51. As regards the Metur Project, the proposals altogether overlooked the necessities of command and the project is certainly defective in this respect. These necessities have only quite lately been recognised, and it is only in this later part of these proceedings that the bearing of the gauge reading at the Cauvery Dam on the supply of these upper channels has been clearly realised. This is the reason why this matter was not taken up from the first, and the conditions and necessities of this irrigation only described at this later stage.

Whatever the other officers who have written on the subject may have done, the matter of *command* necessary for these channels was certainly overlooked by Colonel Ellis in drawing up the Metur Project.

It has been stated that adequate supply, if maintained as a steady supply, can be given to the upper channels with a 6 feet gauge. This is quite different from the maximum useful supply which is admitted whenever practicable because the supplies are fluctuating.

There is frequent scarcity in the Cauvery channels between September and November; the supplies are very fluctuating and often inadequate.

In bad years, *Koramboos* are constructed from about the 20th November and on one channel, the Wyyacondan, one is even put up occasionally in September when the river is low, but this is almost always washed away by a temporary rise of the river and another has to be constructed between November and January.

Reference-Mysore, paragraph 81.

52. The procurable facts as regards gauge readings on these channels have been communicated in Ma. 18. These facts were not available when paragraph 104, Ma. 14, was written, and the 7 to 8 feet there specified were qualified by the statement "it is believed." The facts alluded to lead to the deduction that the stage of the flow at the Cauvery Dam required to give the maximum useful supply to these channels is 6½ feet and not 7 to 7½ feet as previously claimed, and it is now contended that interference in the reduction of natural flow of the river at any stage below that due to 6½ feet at Cauvery Dam will have the effect of reducing the useful supplies now passed under the incidence of such natural flow into these upper channels.

PART XIII.—FACTS AND ENGINEERING ARGUMENTS—THIRD ISSUE.

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53. The necessity for further discharge observations has been admitted by both parties. The only matter at issue is the number of places at which such observations are necessary. It is considered that on this matter both parties will agree to abide by the decision of the Arbitration Committee.

Reference-Mysore paragraph 82.

54. The reply of Mysore does not dispose of the limitation qualifying Sir J. Benton's remark. It may be added, Sir J. Benton's views are only those of a highly qualified expert, and in this matter they fully support the contentions of Madras as regards the whole case.

Reference-Mysore paragraph 83.

55. Madras do not make a claim that any allowance in the form of "limit flow" or quantity of flow shall be made with a view to any rights to future developments of irrigation; but they do claim that the mode of measurement fixed shall be such as shall not interfere with, or destroy, their existing rights of future development, by means of economies through subsidiary works.

Reference-Mysore paragraphs 84 and 85.

As regards the system now proposed by Mysore, that part of it which provides for applying a factor to the flow at Kannambadi with a view to forecasting the probable flow at the Upper Anicut is recognised by Madras as a reasonable proposal, and one which, while giving to Mysore great advantages as regards impounding, may, subject to fixing suitable factors, adequately protect Madras interests while leaving Madras and Mysore mutually free to develop irrigation resources by more economical distribution, by storage, etc.

The part of the system which is strongly opposed by Madras is that part which provides for measurements at the Upper Anicut and the system of compensation water. This is not by any means an essential, although it is an integral, part of the Mysore new system, and it is not either easily, or accurately, workable. The matter is discussed further below.

56. The Government of Madras claim that, except as regards such concessions in the matter of flood discharges, etc., which they are prepared voluntarily to concede, their rights shall be conserved unimpaired.

Reference-Mysore paragraphs 86 and 88.

In regard to what Mysore terms "useful surplus," a decision which gives a limit flow which will preserve Madras rights unimpaired, does not give scope for useful surplus over and above this limit as explained in Ma. 14, paragraph 115.

57. It is not a fact that no reservoir would be possible in Mysore without some disturbance of the quantity and incidence of natural flow of the river *within the fixed limit flow.*

Reference-Mysore paragraph 89.

The system of measurement proposed by Madras provided for this and the small reservoir to the construction of which Madras have agreed could be successfully worked under such a system without interference *within the limit* either of the incidence or quantity of natural flow.

58. Madras adhere to the arguments of their paragraphs 117 to 122.

Reference-Mysore paragraphs 90, 91 and 92.

It is denied that the *minus figures* are due to inaccurate estimate of the time of transmission, but it is recognised that time of transmission is a factor constantly varying and not capable of accurate statement. It is by examination of diagrams based on working tables that interference with incidence and quantity of useful flow can best be studied. The very fluctuating natural flow of the Cauvery is one of the great difficulties with which existing irrigation has to contend and any system which *within the limits of useful supply* makes these fluctuations greater, *ipso facto* does hurt to Madras. A system of making up for deficient supplies by subsequent abundant, and frequently superabundant, ones cannot be considered as non-interference with existing rights, as the system entails injury to Madras.

59. The *minus* figures and other unmeasurable losses, which are correctly computed under Table III, but which would not be capable of computation without previous measurement of the actual *natural flow at the Upper Anicut* (column 3), are due to two causes, *viz.*, deficient draw-off (R) and absorption (S) (Ma. 14, paragraph 124) and not to losses (R) of the upper canals alone.

Reference-Mysore paragraphs 93 and 94.

. At certain times and especially in June, absorption is great and for this reason *minus* figures appear with special frequency in this month, combined with the fact that natural flow is at this time frequently small. This matter of absorption is the explanation of the apparent discrepancies noticed in Mysore paragraph 94.

60. The Cauvery channels frequently take water at a duty of 30 acres per cusec and this in Madras and also in Mysore is the basis on which limit of useful flow is generally computed for these marginal channels.

Reference-Mysore paragraph 95.

61. It is true that the area of irrigation in June in these channels is below the normal area of later months, but the absorption in June is very great and this accounts for the persistent recurrence of *minus* figures in this month.

Reference-Mysore paragraph 96.

62. The losses of the upper channels are not confined to the days on which *minus* figures appear in the tables, but are suffered every day in which the natural flow of the river is reduced in quantity between the stage of flow which gives maximum useful supply to the channels and the stage which gives no supply. The loss is persistent and continuous in these stages. The losses cannot be made up by sending down compensation water equivalent to the loss, but only by reproducing the *stage of flow* required to give back the deficiency which is a very different matter and impossible to effect in practice by means of compensation water. The Mysore contention that the losses are confined to very few days will be admitted as inaccurate under the above explanation.

Reference-Mysore paragraphs 97 and 98.

63. This is again insistence on the value of *useful surplus* which Madras claim is an admission by Mysore that the "limit flow" of their proposal does *not conserve unimpaired* the rights of Madras.

Reference-Mysore paragraph 99.

64. It does not follow because a year is the worst on record that the deprivation and interference is in that year the greatest. Indeed, as interference can only occur on days of impounding, the interference will be on fewer days in years when impounding takes place less frequently. On the other hand, a deprivation or unfavourable interference in a bad year has a worse result than a similar improper interference in a good year.

Reference-Mysore paragaraph 100.

The contention of Mysore in this paragraph is denied.

65. As noted above, the consideration of future developments of irrigation in Madras is not made the basis of any claim in connection with the limit quantity of natural flow to which Madras has prescriptive rights, but it is claimed that the mode of measurement adopted shall not be one which will hamper future development of irrigation by Madras.

Reference-Mysore paragraph 101.

Expansion of irrigation does not necessarily mean use of more water. For instance, in many channels in the area in question, distribution of water to fields is by means of open cuts in banks or roughstone sluices of rectangular cross section not computed or proportioned to the area to be supplied.

Re-sluicing works in these channels have been going on gradually for many years, these works consisting in replacing such sluices or openings by pipe sluices with vents proportioned to the requirements of the area under them. By such works gradual extensions of irrigation and improvements of supply to tail-end lands are made possible through more economical distribution and without taking any more water than previously.

Any such expansion in the future will, under a system of measurement at the Upper Anicut, be made a matter of claim by Mysore as trenching on and reducing the flow at that place and thus increasing the amount of compensation water to be

passed by Mysore. The result of this would be abandonment of all future attempts at economy or conservation.

Again, the system makes any proposal for new tanks or reservoirs in the whole valley of the Cauvery above the Upper Anicut open to objection by Mysore as diminishing the flow there. Minor improvements are continually under consideration and introduction in this large area and under the Mysore proposals they will all have to be the subject of check and opposition in Mysore. As regards the effect of the Mysore system so far as it comprises compensation water and measurement at the Upper Anicut, the same objections apply in regard to any larger schemes. Thus, this system implies constant check on development, constant disputes and friction with Mysore, constant resort to lengthy and expensive arbitration.

The claim to conserve development rights already existing is made not as regards any quantity of water to be allocated against future development but as regards system of measurement, and it is claimed both as an existing right and as fair and reasonable that such a system of measurement shall be adopted as will not be open to the objection that it places obstruction of a grave nature in the way of all future development of resources by Madras in the valley of the Cauvery above the Upper Anicut.

The measurement at the Upper Anicut and passing compensation water much of which must be surplused to waste, is an integral part of the Mysore system but it is by no means an essential part. A reasonable increase in the proportion of water to be passed to Madras would obviate the necessity for compensation water and render all measurement at the Upper Anicut or below Sivasamudram unnecessary.

66. It will be impossible, under the system of measurement at the Upper Anicut proposed by Mysore, to make accurate measurement of the amount of compensation water due to Madras.

Reference-Mysore paragraph 101, last clause.

For the purpose of working tables, when considering the incidence of flow of past years, this impossibility does not exist, as actual measurements of the natural flow are available and, with these as a basis to work on, quantities of compensation water can be accurately computed, and the computations shown in the tables correctly represent matters as existing in the past. This would not be so after impounding commenced, since this knowledge of quantity of natural flow would not then be available.

Compensation water based on measured flow at the Upper Anicut will not represent the quantity unjustly withdrawn from Madras, but generally less quantities, which are moreover not susceptible of computation.

The headings in Table III, columns 5 and 7, involve inaccurate nomenclature and do not represent what the "net flow" or "resulting flow" would have been, but merely the differences of the columns. To be strictly accurate, the above words should be deleted from the headings of the columns.

The results of the computation are correct, and give correct figures for computing the compensation water in column 7, but the names given to the columns are incorrect. What the *resulting flow* at Cauvery Dam on any day due to impounding at Kannambadi would actually be, is not susceptible of accurate computation, and, similarly, from measurement of the resulting flow after impounding, no accurate computation of the corresponding *natural flow* can be made.

From a knowledge of the *natural flow* measured at the Upper Anicut, a mathematically correct calculation of *compensation water* due to any specified impounding can be made; from the basis of measurement of *resulting flow*, no correct computation of *natural flow* or *compensation water* can be made.

As under the Mysore proposals the latter only can be measured, there will be no basis for correct calulation of *compensation water*.

67. The basis of the inaccuracy of computations of compensation water is due to the quantities R + S as described in Ma. 14, paragraph 124.

Reference-Mysore paragraph 102.

The incidence of loss under the factor *R* is not confined to days when the tables show *minus* flow but occurs as stated in paragraph 62 above on every day

when impounding occurs and the stage of the natural flow of the river is between what would give to Cauvery channels anything between full useful supply and no supply.

Reference-Mysore paragraphs 103 and 104.

68. It is perfectly true that the factor *S* will be negative as well as positive, but it will be positive on a falling river and the result would be that Madras would be deprived of water due when water was scarce, and given back water when water was plentiful.

In addition, as a *minus flow* cannot be realised in nature, the occasions on which a *minus* flow is recorded by calculations would be also occasions on which loss would be suffered by Madras.

Reference-Mysore paragraph 105.

69. It is possible in a system in which the irrigation consists of a narrow strip of cultivation along the main river and when economical distribution of water is not practised that quantities of water within the limits stated may be returned to the river. In the case of the Mysore Cauvery Project, the bulk of the irrigation is remote from the main river and in a very absorbent and porous soil. There are further a number of tanks in the area and drainage water from the fields will be caught up in these tanks.

The contention of return to the main river of any material percentage of the water placed on the land cannot be admitted with regard to any but the river side channels.

These channels already take large quantities of water—very much more than economical distribution would demand. Under the new system these channels which will be supplied with reservoir water will be remodelled and economies will be practised, and it is unlikely that the return to the river from them will be materially greater than it is at present.

Reference-Mysore paragraphs 106 and 107.

70. As regards Marikanave reservoir, the stream across which the reservoir was made is comparatively small and quite devoid of marginal irrigation. It is not surprising that the introduction of a large reservoir and system of marginal irrigation should have resulted in a small flow being realised during dry months when the reservoir water is at high level or when irrigation is being practised along the margins. Such a result, if it is actually experienced, does not disprove the Madras contention as applied to such a river as the Cauvery which has been taking a great part of its flow, except during the flood season, into the marginal channels, from time immemorial.

Reference-Mysore paragraph 108.

71. On all the above grounds, Madras retain their objections to any system of measurement which involves measurement at the Upper Anicut and the specific reasons for this are given concisely in Ma. 14, paragraph 126.

Appendix XXVI.

Extract from G. O. No. 400 I., dated 24th September 1909, approving the report on the closure of the construction estimate of the Lower Coleroon Anicut System.

21. The North Rajan channel is provided with a head sluice of four vents each of 4′ × 5′; it is 28 miles 18·5 chains long and irrigates about 20,252 acres, with an F.S.L. of 6 feet on sill of head sluice corresponding to a discharge of 715 cubic feet per second, giving a maximum capacity duty of 27 acres per cubic foot per second. All the regulating works and head sluices for the branch channels have been constructed. The head sluice to Thirunarayur branch, the regulators at the tail end, and the works required, for diverting the surplus from this channel into the Gavarapattu channel, were incomplete at the time the construction estimate was closed.

22. This (North Rajan) channel crosses in its course the old Coleroon (the chief drainage channel of this system) and the Gavarapattu irrigation channel where aqueducts have been built. Only one aqueduct was built at the former place, but subsequently another one was also built in connection with the improvements to the Chidambaram drainage (to be described later on). The Gavarapattu channel is a branch of the Khan Sahib's canal (to be described later on) and is used partly as a drainage and partly as an irrigation channel. The Khan Sahib's canal and the Gavarapattu channel are supplied from the North Rajan channel during times of scarcity and the works constructed for this will be described later on. Of these, the regulator across the Pettai branch and the surplus work to divert the water into the Gavarapattu channel, were in progress at the time of closing of the construction estimates.

23. The Vadavar has an open head and is crossed at its head by means of a bridge of three arches, one of 60′ span and two of 20′ carrying the Madras-Kumbakonam road. The channel is a high level one and supplies 11,066 acres of direct irrigation by means of branch channels and empties itself into the Veeranam tank. Full supply is 8′ on the theoretical bed which, however, is so considerably silted, that the F.S.L. discharge has been gauged at only 900 c.f.s. Its bed width varies from 60′ to 100′. The head sluices of all the branch channels were being fitted with screw-gearing shutters at the time of the closing of the construction estimates.

24. The Veeranam tank is a very old tank supplied by the rainfall on its catchment of 195 square miles besides being fed by the Vadavar as just mentioned. It irrigates 45,159 acres by means of various channels, all of which are provided with head sluices with screw-gearing shutters. The tank has three surplus weirs and a natural paved byewash at its southern flank. There is also a surplus weir at the northern flank provided with screw-gearing shutters and a surplus sluice fitted with screw-gearing shutters at the same flank called the Shatiatope supply sluice.

25. The surplus over the southern weirs passes down an old drainage channel into the Khan Sahib's canal, down which it passes to the two Kopadi weirs which discharge it into the old Coleroon.

26. The surplus over the northern surplus weirs enters the Vellar below the Shatiatope anicut and that over the sluice enters the same river above that anicut. This latter sluice is double-acting, for it occasionally supplies Vellar water to the Veeranam tank as well as being used more ordinarily to supply the Veeranam tank water to the Shatiatope anicut system.

27. The drainage from the lands under the Vadavar and the channel from the southern surplus weirs of the Veeranam tank unite to form the Khan Sahib's canal which, in its course, receives the drainage from the lands under the

Veeranam tank also. This canal, though it is thus primarily a drainage channel, is used also for irrigation. For about five months in the year, during the monsoons, it was also at one time used as a means of communication from Bhavani on the Cauvery through Coimbatore, Salem, Trichinopoly and South Arcot districts, to Porto Novo. It is now no more used as a navigation canal except for a little local traffic. When used for navigation it emerged from the Veeranum tank through two upper locks which have long since been demolished.

28. As an irrigation channel it irrigates about 12,946 acres. In the early part of the year the supply is very precarious, while in the rainy season it is excessive by reason of the abundant drainage. To provide a means for the supply of water for irrigation during times of scarcity, a vent was opened in the side wall of the Puliyangudi aqueduct of the Rajan voikal. This aqueduct is an old work on the Rajan voikal at about 15 miles from the head, constructed for draining the lands between the river bank and the channel into the Khan Sahib's canal. As this drainage has been since diverted into the river, the aqueduct is not now in use.

29. The drainage received into the Khan Sahib's canal passes along it down to Kopadi weirs as abovementioned (paragraph 25). These weirs were constructed here in the right bank of the channel for discharging the surplus into the old Coleroon. The surplus water after passing over the weirs has to pass under the Rajan voikal and one aqueduct was first constructed at this place. As the waterway of this was quite insufficient, another aqueduct was subsequently constructed as mentioned in paragraph 22. With a view to send down as much of the drainage through the old Coleroon and to prevent the Khan Sahib's canal from carrying more than what it can carry safely, a regulator and flood bank were constructed across the Khan Sahib's canal just below the surplus weirs. These works were under construction at the time the project estimate was closed.

30. A branch from the Khan Sahib's canal takes off at about a mile below the Kopadi weirs and is known as Gavarapattu channel. This channel is also both an irrigation and drainage channel, and irrigates about 2,500 acres. It suffers from scarcity of water in the early part of the season and later on just before harvest when there is not much drainage. To supply water during these times of scarcity, a sluice has been constructed in the right bank of the Pettai branch of the Rajan voikal. This work was under construction at the time of the closure of the project estimate. The old head sluice and Gavarapattu channel was about to be rebuilt on improved lines when the construction estimates closed.

31. To relieve the Khan Sahib's canal from the large quantity of drainage entering below the regulator and flood bank described in paragraph 29, three surplus works have been constructed on the canal, two on the right and the third on the left bank. The first of these is known as the Muthia Pillai surplus and is of three spans fitted with screw-gearing shutters of 10 feet × 4½ feet. The second is the one known as the Tiruvakulam (Tiruvarkulam) calingulah about two miles below the town of Chidambaram. This work had a solid body wall, and in order to give a greater waterway, the body wall was demolished, and the work fitted with lift shutters of five spans of 8′ × 5½′ each. These two surplus works discharge into the Uppanar drain. The third surplus weir discharges through an existing old drain into the Vellar. The fitting of the lift shutters of the Tiruvakulam calingulah was in progress at the time of the closure of the construction estimates.

32. The Khan Sahib's canal ends in the old Porto Novo lock through which boats used to pass into the Vellar backwater at Porto Novo. As the lock is not now in use, it is fitted with lift shutters and acts as a terminal escape for the Khan Sahib's canal.

33. The drainage from the middle portion of the area irrigated by the Veeranam tank is caught by means of a shallow tank known as Ponneri tank and irrigates about 3,284 acres. The supply is also supplemented by means of a channel from the Veeranam tank. The surplus of Ponneri tank and the drainage of that portion of the Veeranam tank which does not fall into the Khan Sahib's canal, form a drainage channel known as Pasimuthan odai which empties itself into the Vellar about five miles from Chidambaram.

34. This is purely a drainage channel down to Chidambaram town but is afterwards used for the irrigation of about 2,880 acres. Near Chidambaram, it has been provided with a surplus work on its right bank known as Tillai Amman calingulah which discharges into the Khan Sahib's canal. At respectively one mile and two miles below this outlet, for the sake of holding up water for irrigation purposes, two calingulahs with solid body walls were built across the odai in old days. As these obstructed the free flow of drainage down the channel, the solid body walls were demolished and the weirs provided with lift shutters, each of four spans of 15′ by 5′ high. This work was in progress at the time of the closure of the completion estimate. The irrigation sluices taking off from the above drainage channel have been provided with rack and pinion shutters for the regulation of water, but this work had not been completed at the time of the closure of the construction estimates.

35. The old Coleroon, referred to in paragraph 29, is an old channel, and as it was not wide and deep enough to carry the large quantity of drainage entering it, it was widened and deepened on an estimate of Rs. 81,300 and the work was nearing completion at the time of the closure of the completion estimates. The drain was proposed to be widened to 130 feet; but, after it had been dug to that width for some distance, it was found that the expense was likely to be very high and it was decided to reduce the width of the channel to 100 feet. The ultimate cost of the work was Rs. 81,300.

36. On the south of Tanjore flank of the lower anicut the South Rajan voikal takes off with a sluice of two vents, each 8′ × 7′ built in a line with the anicut. A leading channel about a furlong in length connects this with the Coleroon and a scouring sluice to the left of the head sluice worked by shutters, keeps the former clear of silt. The South Rajan channel is about 28 miles long; is of varying width and very crooked in places; irrigates 17,027 acres situated in Kumbakonam, Mayavaram and Shiyali taluks of the Tanjore district; has a depth of 6 feet when carrying full supply and discharges 445 cubic feet per second, representing a maximum capacity duty of 38 acres per cubic foot per second. It has two masonry calingulahs built across it to raise water to high level lands near them; the first is at 12 miles and 200 feet and has recently been remodelled and fitted with shutters 8′ × 3½′ worked by rack and pinion arrangements. The second is at 17 miles, 6 furlongs and 630 feet and is an old work with 2½ feet upright stones built into it. Many main and minor branches take off from the South Rajan, but only a few of them have been provided with sluices at their heads; one of those, the Oosi voikal which takes off at 15 miles, 5 furlongs and 460 feet on the right bank is about a mile and a half long, has an open head and surpluses into the Pudumaniar which it supplements during periods of scarcity. The bridge at 15 miles and 2,000 feet which carries the Panangattangudi-Shiyali road and has been converted into a regulator worked by needle shutters, serves to divert water down this Oosi voikal. The channel crosses many drainage courses, the most important of them the Odiyar and the Kondappan Cauvery which it crosses by means of masonry aqueducts known, respectively, as the Narimudukku and the Kondappan Cauvery aqueducts; the other drainages are syphoned under the channel; a few more drainages enter the channel, one of them below the Sidhamalli calingulah near Kurichi village draining about 2·89 square miles; and this is received into the Coleroon through the surplus work at 14 miles, 7 furlongs and 150 feet known as Vannaodappu, consisting of 4 vents 4′ × 4′ 6″ worked by needle shutters but now being rebuilt and fitted with screw-gear. The Alinjiyar and Olai voikal are also taken in and surplused by means of outlets in its left bank into the Coleroon. The channel is provided with eight road bridges and in ninth bridge takes the South Indian Railway over it, close to the Coleroon.

37. The Kumukkumanniar is 8 miles, 1 furlong and 313 feet long, has a fall of 6″ per mile: discharges nearly 130 cusecs when running full: irrigates 1,280 acres of high land lying between it and the South Rajan, and supplements the Manniar also to a certain extent. The southernmost vent (6′ × 7′) of the South Rajan head sluice admits supply into the Kumukkumanniar when the drainage of lands served by the Manniar into its upper reach, and which enters the channel at its head, proves insufficient. There are a small number of irrigation

sluices and two road bridges, one for Olugacherry at 3 furlongs and 530 feet and the other at its tail end. A few outlets built in it discharge the excess supply either into the South Rajan or the Odayar surplus, while a syphon near its tail end leads the drainage of a small extent of land to the right of it into the Kondappan Cauvery. It crosses the Odayar by a masonry aqueduct 94 feet long from end to end and 13 feet broad, pierced with 5 vents each 3′ × 6′. Close by it crosses the Oosiyar, a branch of the Odayar, by another aqueduct similar to the above, to which Oosiyar water is raised by means of a regulator built in front of the first aqueduct and worked by rack and pinion shutters. A tail drop carrying also a roadway arranged to raise water to lands above, surpluses excess supply into the Manniar.

1

Statement C.

STATEMENT of number of days in each month for twenty years when there is a recorded flow at Bhavani bridge in March, April and May and the average daily flow of such days and the maximum recorded in million cubic feet per day.

—	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899
1	2	3	4	5	6	7	8	9	10	11
March.										
Number of days when there is flow over 1,000 cusecs.	...	5	...	31	3	...	...	...	...	...
Average flow of those days in mill. c. ft.	...	267	...	206	244	...	...	...	...	...
Maximum flow recorded in mill. c. ft.	...	545	...	515	545	...	...	...	...	...
April.										
Number of days when there is flow over 1,000 cusecs.	...	3	3	5	19	19	...	...	8	16
Average flow of those days in mill. c. ft.	..	139	108	302	107	131	...	...	167	307
Maximum flow recorded in mill. c. ft.	...	163	120	375	138	158	...	...	189	683
May.										
Number of days when there is flow over 1,000 cusecs.	31	6	31	...	31	31	11	31	29	29
Average flow of those days in mill. c. ft.	293	96	448	...	148	152	212	113	156	154
Maximum flow recorded in mill. c. ft.	868	104	1,113	...	189	375	611	189	400	351

—	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909
	12	13	14	15	16	17	18	19	20	21
March.										
Number of days when there is flow over 1,000 cusecs.	...	5	...	..	28	1	...	...	...	...
Average flow of those days in mill. c. ft.	...	101	...	...	97	99	...	...	...	...
Maximum flow recorded in mill. c. ft.	...	109	...	...	103	99	...	...	...	...
April.										
Number of days when there is flow over 1,000 cusecs.	1	...	10	...	7	...	...	...	...	14
Average flow of those days in mill. c. ft.	88	...	100	...	102	...	...	...	...	121
Maximum flow recorded in mill. c. ft.	88	...	114	...	107	...	...	...	...	189
May.										
Number of days when there is flow over 1,000 cusecs.	7	23	31	22	30	15	5	...	19	28
Average flow of those days in mill. c. ft.	113	250	140	432	441	157	116	...	266	959
Maximum flow recorded in mill. c. ft.	155	575	279	754	1,113	211	133	...	400	6,620

Appendix XXVIII.

STATEMENT showing the approximate areas of crops requiring water from February to May under the Cauvery channels in a normal year in the Trichinopoly district.

Taluks	Area of crops requiring water in the month of				Remarks
	February	March	April	May	
1	2	3	4	5	
	Acs.	Acs.	Acs.	Acs.	
Trichinopoly	9,424	8,728	7,648	7,648	
Musiri	7,286	7,158	6,073	5,262	
Kulittalai	10,035	8,407	9,084	4,122	
Karur	3,357	2,868	2,286	2,140	
Namakkal	4,198	4,411	964	1,079	
Total ...	34,300	31,572	26,055	20,251	

Exhibit My. 16.

PART I.

What is the true interpretation of the Agreement of 1892?

PRELIMINARY.

My. 6, paragraphs 1 to 5.
Ma. Appendix A.

The discussions which led to the Agreement of 1892 were begun by the Madras Government about the year 1889, when they took objection to certain irrigation works proposed in the Mysore State in the Palar and Pennar basins. As matters could not be settled by correspondence, a conference of the representatives of the two Governments was arranged in the year 1890 with a view to come to an understanding by personal discussion on the subject of irrigation developments in Mysore. The proceedings of this conference show that the Madras Government took up a somewhat uncompromising attitude on that occasion.

My. 6, Appendix A.

2. It was at this stage that the then Dewan, the late Sir K. Sheshadri Iyer, submitted the whole case for the consideration of the Government of India. The Madras Government also addressed a letter to the Supreme Government in which they suggested that some pressure might be brought to bear on the Mysore Durbar in the matter. Thereupon, the Government of India desired that the question should, if possible, be settled by mutual understanding between the two Governments. This led to the conference of 1891 which resulted in the Agreement of 1892.

3. The correspondence connected with the two conferences throws full light on the circumstances which led to that Agreement and shows that special precautions were taken by both the Governments to make the terms of the Agreement clear, so that future complications might be avoided in regard to the interpretation of the Agreement and to the application of the law bearing on the subject to individual cases as they arose.

LEGAL ASPECTS OF THE CASE.

My. 6, paragraph 8.
My. 12, paragraphs 3 and 5.

In discussing the question of the law applicable to this dispute, certain preliminary points regarding the wording of

the issues were raised by Madras. At the beginning, Madras found it "difficult to see what the first issue was intended to cover"; and they also objected to the form of the second issue, "What is the extent of the prescriptive rights of Madras?" After it was explained that both these issues had to be determined in order to answer the question whether Madras were right in objecting to the construction of the new reservoir, the contentions were not further pursued.

My. 12, paragraph 4.

5. In this controversy Mysore do not rely on the arguments of "permissive user" and "joint possession," referred to in Ma. 7, paragraphs 15 and 30.

My. 6, paragraphs 6 to 11.
My. 9, paragraphs 2 and 7.
My. 12, paragraphs 9, 22 to 24.

6. *What law is applicable?*—The law of prescription alone is applicable to the case since the Agreement of 1892 specifically provides for it and since the correspondence which preceded its conclusion shows that such provision was deliberately made.

Therefore, the lengthy discussion of legal points in Ma. 7, paragraphs 14 and 16 to 46, which were mostly drawn from the doctrines relating to international law and law of riparian rights, is considered irrelevant by Mysore. It is now conceded by Madras that the principles both of the law of prescription and of the law of easements govern the present dispute (Ma. 14, paragraph 3).

7. Under the law of prescription, Section 26 of the Limitation Act should apply to the case. This statute law which was introduced into Mysore in the year 1871, was in force both in Mysore and Madras when the Agreement between the two Governments was concluded and sufficient internal evidence has been quoted to prove that this provision alone should be presumed to have been present to the minds of the parties to the Agreement of 1892. Madras, however, thought that it was immaterial whether the rule of common law prescription or that contained in Sections 26 and 27 of the Limitation Act applied to the case (Ma. 11, paragraph 5) and later on stated that the question of the particular kind of prescription that the authors had in view was of little practical significance in the present circumstances. This view is not correct as the point is of practical importance since it explains the contention of Mysore that the year 1890 should be taken as the starting point of the prescriptive period and that the enjoyment of any right claimed by Madras should have continued to within two years from the date of suit. As regards matters

outside the scope of the provisions of the Limitation Act, the general principles of the Law of Easements have to be referred to.

My. 1, paragraph 3.
My. 4, paragraphs 2 and 4.
My. 6, paragraphs 12 and 13.
My. 9, paragraphs 4 and 8.

8. *Prescriptive right to what?*—The prescriptive right of Madras does not apply to mere flow. User is the soul of a prescriptive right. It applies to the quantity of water actually used from time to time by Madras for the purpose of irrigation. Rule III of the Agreement makes this clear, apart from the ordinary requirement of the prescriptive law.

My. 6, paragraphs 17 to 22.
My. 9, paragraph 5.

9. *Extent of prescriptive rights and mode of enjoyment.*—This should be determined with reference to:—

(1) the law of prescription, and

(2) what is fair and reasonable.

Rule III of the Agreement prescribes both these bases which are not in conflict with each other, as the question of the extent of a prescriptive right is a mixed question of *law* and *fact*.

10. Under the prescriptive law, both the *extent* and *mode* of enjoyment of the right must be fixed with reference to:—

(1) the probable intention of the parties as embodied in the Agreement,

(2) the purpose of the prescriptive right determined with reference to all the surrounding circumstances at the time of such Agreement, and

(3) the *user* of such right consistently with the terms thereof including the *nature* of such user, which in this case means periodically fluctuating quantities of water depending on the varying needs of irrigation.

My. 12, paragraph 10.

11. *Application of these principles to the present dispute.*— The claim of Madras is with reference to:—

(1) the flow required during February to May; and

(2) that required during June to January.

My. 12, paragraphs 11 to 16.

12. The first claim relates to the hot weather supply with reference to which it has been pointed out that no understanding has been arrived at as incorrectly assumed in paragraph 99, Madras, Part VI and that this question has also to be decided on the basis of prescription. The Madras case with regard to the hot weather supply has undergone various

changes, as noted in paragraph 12 of My. 12. Mysore contend that Madras should adduce satisfactory proof of the circumstances urged by them as supporting their claim to the hot weather flow, the points for decision being as follow:—

(1) whether hot weather irrigation actually exists in Madras above the Upper Anikat under the Cauvery;

(2) assuming the existence of irrigation, whether the right to draw off the water has matured into a prescriptive right in their favour; and

(3) what the extent of such right as well as the limits of flow required are.

My. 6, paragraphs 14 to 16.
My. 9, paragraphs 3, 6, 9 and 10.
My. 12, paragraphs 17 to 20 and 26 and 27.

13. With regard to the flow from June to January, the Mysore contentions are:—

(*a*) Right of Madras to 6 feet flow on the Cauvery Dam for irrigation in the height of the flood season is admitted by Mysore. But it is contended that the alleged claim to 7 feet, *i.e.*, one foot extra at the Cauvery Dam, has not been legally acquired as a prescriptive right for want of twenty years' enjoyment (Section 26 of the Limitation Act and Rule III of the Agreement).

(*b*) The alleged claim to 1 foot on the Upper Anikat, even if it had amounted to an easement or prescriptive right, is not actually existing within the meaning of Rule III of the Agreement, as, like an easement of necessity, it ceased when the necessity therefor came to an end by the remodelling of the Upper Anikat in 1899-1902. This flow was not connected with the delta irrigation and cannot therefore be claimed as a prescriptive right for such irrigation as it would impose a new burden on Mysore. The fair inference to be drawn from the alterations to the Upper Anikat made in 1899-1902 and the local circumstances connected with them, is that this right, if any, was abandoned by Madras.

(*c*) The Madras claim to 7 feet on the Cauvery Dam and 1 foot over the Upper Anikat is not a single indivisible claim, as, before the remodelling of the anikat, the arrangements in existence were such as would necessarily divide the flow into two parts.

After the remodelling, the 1 foot flow over the Upper Anikat was altogether detached from the 7 feet flow over the Cauvery Dam and completely stopped in actual use.

My. 6, paragraph 18.
My. 12, paragraphs 21 and 25.

(*d*) Madras have not earned a prescriptive right, to any *one particular limit of flow throughout the period*, but only to fluctuating quantities dependent upon varying flow in the river and the varying needs of irrigation. Mysore also contend that, in determining the extent of the Madras rights, the area under irrigation should be taken to be the chief criterion. The authorities quoted by Madras do not disprove this proposition.

My. 1, paragraphs 24 and 34.
My. 6, paragraph 19.

14. So far, the law which governs the case in dispute is clear and is set forth in the rules of the Agreement of 1892. The respective rights of the parties are also clear in the light of this Agreement, *viz.*, Madras have a right to demand that the supply of water required for their prescriptive irrigation should not be materially interfered with; while Mysore are entitled to the use of all the waters over and above what is required to safeguard Madras prescriptive irrigation. This position is accepted by both the parties. Mysore urge that, in interpreting the terms of the Agreement and in determining the extent of the prescriptive rights of Madras and the mode of exercising them, certain large considerations of natural equity may be prominently borne in mind. These considerations are :—

(1) More than two-thirds of the waters of the Cauvery flow is from Mysore Territory; but the extent of irrigation in Mysore dependent on the Cauvery river, is only $\frac{1}{12}$th of the whole area under it.

(2) The natural features of the country in Madras allow direct flow irrigation to be practised over extensive areas at a very moderate outlay, while the ruggedness of the Mysore country renders costly storage works necessary to secure irrigation of even a fraction of the area in Madras.

(3) There is a large surplus which goes to waste into the sea year after year, ranging from 400,000 m.c.ft. in good years, to 45,000 m.c.ft. in the worst year, according to the computations made by Madras. But the Mysore Reservoir is intended to store only a fraction of the average surplus which now does no good to either party.

(4) While Madras expect by their Metur Project to make use of this surplus for irrigating about 2½ times the extent proposed by Mysore with a reservoir of double the capacity, there ought to be no impediment of any kind in the way of the moderate scheme projected by Mysore.

15. These circumstances have a material bearing on the question at issue. It is essential that the Agreement of 1892 and the law applicable to the case thereunder should therefore receive a liberal interpretation at the hands of the Arbitration Committee, so that the people of Mysore may be enabled to utilise their due share of the waters of the Cauvery.

PART II.

(a) What is the extent of the prescriptive rights of Madras against Mysore under that interpretation?

(b) What volume of water measured at the Upper Anikat is necessary to conserve these rights unimpaired?

My. 1, paragraph 4.
My. 7, paragraph 23.
My. 9, paragraphs 12 to 14.
My. 12, paragraphs 29 to 31; 34 and 35.

16. For a proper consideration of this issue, it is necessary that the matter should be viewed under two heads corresponding to the clauses (*a*) and (*b*) of the same, *viz.*, extent or area of irrigation, and the limits of flow required for the irrigation of such area.

(i) Extent of Irrigation.

My. 7, paragraphs 23 to 27.
My. 9, paragraphs 15 to 19.
My. 12, paragraphs 32 and 33.

17. The extent affected is:—

(*a*) the delta area;

(*b*) the area above the Upper Anikat; and

(*c*) the area under the Coleroon.

The delta area.—The area already given by Madras for the delta proper has been admitted by Mysore.

The area above the Upper Anikat.—This area requires to be definitely ascertained. As the total extent cultivated in recent years is found to be greater than in 1890 or previous to that year after examination of the figures given by Madras, the quantity of water taken up for this extra area has to be deducted from the limits that may be fixed as due to Madras on the Cauvery Dam.

The Coleroon area.—The exact extent under the Veeranam tank has to be decided after the information already called for by Madras from the Revenue authorities is duly received and examined.

(ii) Quantity of Water Required.

My. 7, paragraphs 28 to 30.
My. 9, paragraphs 20 and 21.

18. The question of the flow of water has to be dealt with under three heads:—

(*a*) the limit of flow necessary for delta irrigation;

(*b*) the flow required, if any, for Coleroon irrigation; and

(*c*) the hot weather flow.

Requirements of the Delta Irrigation.

19. The flow required for the delta irrigation has to be considered separately with reference to:—

(1) the requirements in the height of the irrigation season, and

(2) the varying requirements in other months.

My. 1, paragraphs 6 and 7.
My. 7, paragraphs 31 and 32.

20. *Maximum limit.*—Madras have been demanding that a limit of 7 feet on the Cauvery Dam should be allowed, with a right to call for additional water when necessary. In lieu of this right, Madras now claim a daily flow up to 644 m. c. ft. on the Upper Anikat. Mysore do not recognise this right as no mention is made of it in any of the rules prior to the date of remodelling. This demand for 644 m.c.ft. has been dealt with separately under the requirements of Coleroon irrigation. Mysore have all the while been contending that a demand for a limit flow of 7 feet at the Cauvery Dam is untenable.

My. 7, paragraph 33.

21. *A depth of six feet only is admissible.*—Substantial proofs, as summarised below, have been adduced to prove conclusively that a limit of 6 feet on the Cauvery Dam really represents the "full and ample supply" required for the delta irrigation.

My. 7, paragraphs 34 to 37.
My. 9, paragraphs 25 and 26.
My. 12, paragraph 38.

22. *Proof from the Bhavani Project.*—In the Metur Reservoir report certain references have been made to the proposed Bhavani Project. From these it is evident that a flow of 6 feet was recognised by the responsible Engineer Officers of the Madras Government as the limit requirement of the delta irrigation in the south-west monsoon. The Mysore project being quite analogous to the Bhavani project in regard to its effect on the delta irrigation, the same limit of 6 feet would naturally be applicable in connection with the storage restrictions on the Mysore Reservoir.

These statements made by responsible officers of the P. W. Department would form perfectly relevant evidence as they tend to throw light on the question of the extent of actual user. If such materials are sufficient to form correct bases for maturing large irrigation projects in Madras, their probative value in this controversy cannot be disregarded.

My. 1, paragraph 7.
My. 4, paragraph 7.
My. 7, paragraphs 37 to 43,
My. 9, paragraphs 22, 27, 30 to 36.
My. 12, paragraphs 36 and 37, 41 to 43; 45.

23. *Upper Anikat conditions.*—The rules of 1882 for the regulation of water at the Upper Anikat (Appendix B) enjoin that the scouring sluices should be opened when the water rises to a level of 6½ feet

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at ordinary times and at 7 feet at times of "scarcity." A head of 6 inches has been admitted to be usually required for scouring; and another six inches may be taken as necessary to make up for reduced section due to accumulation of sand when the flow is low. Thus, the limits of 6½ and 7 feet mentioned in the rules of 1882 really mean net supply to the delta of 6 feet. In fact, the crest of the Upper Anikat is just 6 feet over the Cauvery Dam and the rules are in full conformity with this depth. Also, at this depth no water has been used for scouring at the Upper Anikat and none is allowed for in the rules.

24. The remodelling of the Upper Anikat is admitted to have given facilities for forcing supplies up to 8 feet of water into the delta, *i.e.*, 2 feet more than before. This also indicates that 6 feet was the original limit of supply.

My. 7, paragraph 44.
My. 9, paragraph 37.
My. 12, paragraph 44.

25. *The 150 yards Calingula.*—The 150 yards Calingula was specially constructed so as to surplus when there is a flow of 5½ feet at the Cauvery Dam. This is one more proof that 6 feet on the Cauvery Dam was really considered the full and ample supply for the delta irrigation.

My. 7, paragraphs 45 to 54.
My. 9, paragraphs 28 & 29, 38 to 46.
My. 12, paragraphs 39 & 40; 46 to 50.

26. *The rules for regulation at the Grand Anikat.*—The rules of 1888 for regulation at the Grand Anikat (Appendix C) are quite specific in fixing the "full and ample" supply of water required for the delta irrigation at 17,344 cusecs which corresponds to a flow of 6 feet on the Cauvery Dam. The permissible higher discharges indicated in some clauses of the rules have all been shown as being due to the exigencies of flood regulation. The water registers by themselves therefore do not give any exact idea about the real requirements of irrigation.

27. The rules in force since 1905 framed after the remodelling of the Upper Anikat, specify certain limit supplies in the Cauvery and the Vennar which give a total discharge connoted by a gauge reading of about 6·2 feet at the Cauvery Dam. Considering that facilities for forcing extra supplies were afforded by remodelling, this later limit establishes that 6 feet must have been the original limit of full and ample supply.

28. The larger limits of flow mentioned in the rules of 1902 and later dates for the alternate running of channels in the non-flood season cannot be taken simultaneously and added together to represent the total supply required for the

My. 1, paragraph 8.
My. 4, paragraphs 8 and 9.
My. 6, paragraph 18.
My. 7, paragraphs 55 and 56.
My. 9, paragraphs 47 and 48.
My. 12, paragraphs 21 and 62.

delta area. Besides, these rules are not of 20 years' standing.

29. *Varying limits.*—Thus, 6 feet has been established as the limit due to Madras for the delta irrigation. But this limit would be applicable only during the height of the monsoon season, *viz.*, July August, and 1st half of September, when also the irrigation requirements are at their highest.

My. 1, paragraph 9.
My. 4, paragraph 9.
My. 7, paragraphs 57 and 58.
My. 9, paragraphs 49 to 51.
My. 12, paragraphs 51 and 52.

30. *Limits required in June and second half of September.*—The flow in June mostly runs to waste as shown in Appendix D. In the first half of the month there is practically no irrigation. In the second half, the irrigation is very limited being confined to less than 10 per cent of the total area. Even making allowance for absorption, the limits to be fixed for this month must therefore be considerably less than the maximum limit.

Similarly, the limit for the 2nd half of September should be reduced as the first crop would be harvested then and also the period of maximum demand will have been over.

My. 4, paragraph 6.
My. 7, paragraph 59.

31. *Limits required from October to January.*—From October to January, there is usually plenty of rainfall in the delta area and the requirements are also naturally decreased as the crops mature. Besides, in these months only on very few occasions is the south-west monsoon limit of flow reached. Hence, considerable reductions from the maximum limit are necessary during this season.

My. 1, paragraph 13.
My. 4, paragraph 13.
My. 7, paragraphs 60 and 61.
My. 9, paragraphs 48, 52, 53.

32. *Limits as per Mysore Rules.*—The limits proposed in the Mysore rules (Appendix E) have been fixed with due regard to the above considerations as well as to the provision made in the Metur Project.

The average flow during each fortnight varies very considerably from year to year and no definite idea can be formed of the real requirements from these averages. Also, the fortnightly averages in several years are less than the limits allowed in the Metur Project. Accordingly, the limits provided in that project are taken as the basis for getting an idea of the requirements. In consideration of the fluctuating nature of the flow, an allowance of 25 to 30 per cent is made. These increased limits or those corresponding to the average flow during the past 20 years (based on a 7 feet limit flow at the Cauvery Dam), whichever may be the greater, have been proposed. It must be remembered that, in the calculations, the varying limits are fixed on a consideration

of 7 feet flow which has been the limit supply in the past. Even after impounding under these limits, the daily flow at the Cauvery Dam would on many days be above the 7 feet limit demanded by Madras and so extra quantities can often be admitted into the canals if really needed.

My. 1, paragraph 10.
My. 7, paragraphs 62 to 64.
My. 9, paragraphs 54 to 67.
My. 12, paragraphs 53, 55 to 61.

33. *Resulting yearly discharges.*—Further to show that these limits give all the water actually required for the delta irrigation, the resulting annual quantities of discharge due to these limits have been computed. These do not compare unfavourably with the corresponding quantities shown in the annual Irrigation Revenue reports if regard be had to the fact that the later figures are admittedly very much more than the quantities actually used as due deductions for tail water have not been made.

A similar comparison with the annual quantities of water based on the "full and ample supply" of the rules of regulation of 1888 also shows that the limits of Mysore Rules give ample yearly discharges for the delta irrigation.

It has also been shown that the yearly total supplies realised with the limits proposed by Mysore compare very favourably (*a*) with the theoretical requirements of the rice crop after making due allowance for the rainfall in the delta area and (*b*) with the resulting quantity based on the depth of water in the fields provided in the Metur Project.

34. Appendix F (paragraph 62, My. 7) shows that the area of cultivation from year to year has remained more or less uniform notwithstanding very large variations in the total quantity of water thrown on the fields. The fact is that much more water than is actually necessary is being passed into, and wasted through, the delta area on account of the exigencies of flood regulation.

The real irrigation interests of Madras will not therefore be affected by the proposed impounding in Mysore.

My. 1, paragraph 9.
My. 4, paragraph 9.
My. 7, paragraph 65.
My. 9, paragraph 69.
My. 12, paragraph 63.

35. *Allowance for rainfall.*—It has been admitted by Madras that, on account of excessive rainfall, direct flow to the fields has often been cut off and Mysore urge that the benefit of such short supplies should be given to them so as to enable them to impound more water than with the usual limits.

The rules suggested by Mysore in this behalf (Appendix H) may be accepted.

COLEROON IRRIGATION.

My. 1, paragraph 12.
My. 4, paragraph 12.
My. 7, paragraphs 66 and 67
My. 9, paragraphs 70 to 73.
My. 12, paragraph 61.

36. No good reasons exist for mixing up the flow of 644 m.c.ft. over the Upper Anikat with the actual requirements of the delta irrigation. Such a flow before the remodelling of 1902 would have only surplussed into the Coleroon river and therefore could not have been available for the higher delta area. So this quantity can have no connection with the requirements of the delta proper.

If the claim for 644 m.c.ft. is to be considered, it could be only for Coleroon irrigation directly under the Lower Anikat or under the Veeranam tank. To connect this flow with the requirements of the Veeranam tank, elaborate calculations have been made by Madras in paragraph 41 of Part II (Ma. 7.)

In this connection it should be noted that Madras have claimed (*vide* Ma. 1) only a flow of 66 million cubic feet daily for the supply of the Veeranam tank in the south-west monsoon (June to September).

The present calculations therefore show results obviously far in excess of any requirements.

My. 1, paragraph 11.
My. 4, paragraph 11.
My. 7, paragraphs 68 and 69.
My. 9, paragraphs 74 to 80.
My. 12, paragraphs 64 to 67.

37. *Discharges maintained without specific supplies.*—But the daily records of gauge readings at the Lower Anikat distinctly show that, without any direct replenishment, there is ample flow due to leakage and seepage to meet all the Coleroon irrigation requirements. In fact, the tail water from the rice fields of the delta area, the rainfall over the 1,077 square miles of the Coleroon catchment and the absorption from the floods given out as seepage have been shown to account for this abundant flow at the Lower Anikat. No special provision is therefore necessary. This fact has been clearly admitted in the Metur Project in the following words:--"It is found, as a fact, that although no definite supply through works is being passed to the Coleroon there is always an adequate supply in that river for the Lower Anikat system when the supplies in the Cauvery system are adequate." The tables of discharges at the Lower Anikat (Appendix K and K-1) show that the whole of the Coleroon irrigation including that under the Veeranam tank has been maintained by leakage, seepage, etc., without any specific supply from the surplus works above.

My. 7, paragraph 70.
My. 9, paragraphs 84 to 87.
My. 12, paragraph 71.

38. *Interference with floods.*—The interference with flood conditions by the Mysore Reservoir is much less than it

would be by the Metur Reservoir when constructed. The catchment area over the Mysore Reservoir is limited and it intercepts only a portion of the total flow at the dam site. If anything, the conditions with the Mysore Reservoir, so far as Coleroon supplies are concerned, would be better than with the Metur Reservoir. Appendix W shows that, even in the worst year on record (1899-00), 55,774 m. c. ft. was wasted into the sea at the Lower Anikat; and the tables (Appendix T) show that the quantity that could have been possibly impounded in the reservoir is much less than the quantity so wasted.

My. 1, paragraph 12.
My. 4, paragraph 12.
My. 7, paragraph 77.
My. 9, paragraphs 84 and 86.
My. 12, paragraphs 68 to 70.

39. *Veeranam tank.*—This tank has its own catchment which supplies a considerable portion of the water required for irrigating the land commanded by it. The replenishment required from the Vadavar is reduced by this extent. The quantities actually used in the past years for the Veeranam tank irrigation as shown in column 13, Appendix K, are very small. The figures of actual discharges prove that the daily flow in the Vadavar including the requirements of the Veeranam tank is really less than the quantity of leakage available at the Lower Anikat, even after meeting the requirements of the direct irrigation under the anikat.

It has been shown in Appendix L (paragraph 75, My. 7) that the extent of irrigation under this tank has been more or less constant, though the supplies from the south-west monsoon through the Vadavar has greatly varied from year to year.

Hot Weather Flow.

My. 1, paragraph 32.
My. 4, paragraphs 3 and 4.
My. 7, paragraph 78.
My. 9, paragraph 88.
My. 12, paragraph 11 to 16, 72 to 75.

40. The claim to the hot weather flow (February to May) has to be decided on the basisof prescription. Accordingly, certain limits of flow have to be fixed beyond which impounding may be done in Mysore as admitted by Madras. Mysore, in a separate note dated the 28th January 1913, have shown what limits of flow may be considered as due to Madras on a basis of the average estimated natural flow at Sivasamudram.

Mysore obviously cannot guarantee that the demands of power supply will be constant and they therefore should have the option to modify the quantity of water used for power purposes. Whenever the power supply is stopped for any reason, Madras rights would be respected up to the limits noted above to meet the

requirements of their prescriptive hot weather irrigation. The exact figures representing such areas have to be determined.

Cauvery Channels above the Upper Anikat.

My 12 paragraphs 76 to 81.

41. To justfiy their claim for a higher limit of 7 feet or more at the Cauvery Dam, Madras have tried to connect these stages of the river with the full supply levels of the upper channels. It is, however, significant that Madras themselves have distinctly stated (paragraph 107, Ma. 14) that a stage of 6 feet on the Cauvery Dam would give adequate supplies to these channels.

42. It has been stated by Mysore that the lower stages of $3\frac{1}{2}$ to $5\frac{1}{2}$ feet on the Cauvery Dam can alone be depended upon for the greater portion of the irrigation season and this must have influenced all the previous experienced engineers who proposed large projects on the Cauvery and the Bhavani, when they did not make any special allowance for these upper channels. In fact, the stages of flow from $4\frac{1}{2}$ to 6 feet proposed for such reservoirs would have been ample to meet the requirements of these upper channels.

43. Accordingly, the limit of 6 feet already proposed by Mysore in the height of the season and the varying limits in consonance with the natural stages of the river for other months, would ensure proper supply to the upper channels. Certain gauge readings and diagarms produced by Madras have been examined by Mysore in a note, dated 28th January, which, it will be seen, confirms the above conclusions.

Exhibit Ma. 23.

Short precis of the most material points of Madras Case.

SECOND ISSUE.

The basis of the original pleadings of Madras, Part I (Ma. 1).—The estimate of the least limit natural flow at the Upper Anicut which under actually existing conditions, *viz.*, the conditions existing subsequent to the remodelling of the Upper, Lower and Grand Anicuts, would safeguard Madras rights, was the basis of the original claim, Ma. 1—clause II-a, c and d.

Amended pleadings by Madras are stated in Part II (Ma. 3), paragraphs 3 and 4-II (i) and (iv) and also Ma. 4, paragraphs 3 and 4, clause (3).—The amendment was made owing to the claim of Mysore that " the Madras Government is accordingly entitled to the water-supply for irrigation acquired by prescriptive right." The claim to have strict law applied to the decision of limit quantity of flow at the Upper Anicut made by Mysore and admitted by Madras is upheld by the words of the Agreement of 1892, clause III (Ma. 2) and the circumstances under which the reference to the " law on the subject of prescriptive right to the use of water " was retained in the Agreement when the Madras Government wished it cut out, are shown in Appendix A, Ma. 11, letter of 20th July 1891, from the Chief Engineer, Mysore, to the Joint Secretary to the Government of Madras, Ma. 11, Appendix A. The law is thus now admitted by both parties as the basis on which the extent of prescriptive right has to be judged and Madras claim has been amended accordingly.

2. The reply to issue II which the Madras Government claim to be the proper one is given in Ma. 9, paragraph 44.

3. Madras, Part II (Ma. 8) is descriptive. So far as the descriptions are concerned and statements of facts as apart from inferences, the matter has not been disputed in any material point.

A question has been raised as regards the area of irrigation under the Vadavar and Veeranam tank throwing doubt on the areas in paragraph 35. The matter appears a minor one but is dealt with in Madras, Part XII, paragraph 10 and Appendix XXVI. A clear understanding of the undisputed facts and descriptive details of works is essential to the case.

With the exception of certain inferences and remarks, principally in paragraphs 34, 45 and 47, there is no contentious matter in this part.

Rules of regulation, and information about the conditions of works which actually existed when the rules were framed are set forth.

Statements of areas irrigated above the Upper Anicut given in Appendix III have been the subject of some contention and further tables amplifying these appear in Appendix XV.

Appendix II, referred to in paragraph 47, has been replaced by a revised statement—Appendix XVIII.

4. The remarks which follow are not designed to be a *resume* of the whole case but to draw attention to the most material points of evidence on which the Government of Madras rely in support of their claims and contentions.

It is here premised that the exclusion of any point is not to be taken as ground for the inference that Madras abandon it or that it is not relied on.

5. To facilitate reference and to bring out the minor facts and arguments, a statement is attached to this precis giving a short descriptive title of the subject matter of each paragraph or set of paragraphs in the statements of the case and the

replies and rejoinders to the same, giving against each descriptive entry the number of paragraph originally raising the point, and reference to the successive replies and rejoinders which have passed as regards it between the parties, with further reference to the appendices and exhibits bearing on the point.

A list of appendices and exhibits with entries of the paragraphs in which these are referred to is also given to facilitate reference.

6. The evidence on which the Madras Government rely to establish their contentions as regards the second issue is briefly set forth below. The facts adduced are not disputed—

(*a*) The record of gauge readings of Cauvery Dam at the Upper Anicut and of water levels above and below the Cauvery-Vennar regulators at the Grand Anicut (Madras Appendices VI and VIII).

(*b*) The rules of regulation at the Upper Anicut from 1882 to 1910 (Appendix I).

(*c*) The rules of regulation of the Cauvery-Vennar regulators at the Grand Anicut from the time of construction of the regulators to 1910 (Appendix I).

The regulation has been carried out throughout the period covered by the rules in accordance with the specific executive directions laid down in the rules and, where these directions include permissive clauses, the method of actual use is the evidence of method and extent of user and this is to be found in the record of gauge readings, Appendices VI and VIII.

In the case of the rules of regulation at the Grand Anicut, the rules lay down the conditions, under which ordinary regulation of the Cauvery and Vennar regulators must be subordinated to flood conditions, and the occasions and dates on which under these rules these conditions came into operation are recorded in Appendix XVIII.

There is no conflict between the rules of regulation and the methods of actual regulation, but there are ambiguous expressions in rules, and the Madras Government rely for interpretation of the meaning of such ambiguities on the evidence available as the method of applying the rules, that is, the evidence of actual use is shown in Appendices VI and VIII.

7. *Madras prescriptive right for the Cauvery delta system.*—It is claimed to be established that this right is to the whole natural flow of the river up to a limit of 2,944 million cubic feet per day. This claim is based on the rules of 1882 and 1896 for regulation at the Upper Anicut and on the actual incidence of distribution of flow resulting from the operation of these rules.

The evidence is given by Appendices I and VI.

The arguments are to be found in Ma. 9, paragraphs 7 to 9, 13, 16, 17, 18.

Ma. 12—paragraphs 12 to 14, 19 to 33.

Ma. 14—paragraphs 38 and 39, 41 to 43.

8. The claims of Madras as regards prescriptive right to water acquired at the Upper Anicut for the Cauvery delta system have been contested by Mysore on the ground that according to rules and user for irrigation much less amounts of water have been passed for irrigation purposes through the Cauvery-Vennar regulators.

The contention of Madras in this respect is—

(1) That water for scour always was and still is a necessity to maintain in an efficient state the rivers supplying the Cauvery system.

(2) That this water for scour is not passed into the Cauvery delta although a right and necessity for irrigation purposes.

(3) Further, it is again used for the supply of the Lower Coleroon system.

The necessity of water for scour is admitted by both parties.

It is dealt with in—

Ma. 9—paragraphs 8 and 9.

Ma. 12—paragraphs 25 to 32.

Ma. 14—paragraphs 38 and 45 to 50.

Part XII (Ma. 22), paragraph 11.

The rules and modes of regulation and the water actually passed for irrigation through the Cauvery and Vennar regulators prove constant use in the past of water up to the limit of a 7 ft. gauge over the Cauvery Dam and occasional use up to more than 7½ ft.

The arguments and facts cited by Madras in support of the above are :—

Ma. 8, paragraph 45,
Ma. 12, paragraphs 35 to 47 and Appendices VIII and XVIII.

NOTE.—The appendix referred to in paragraph 41 should be Appendix VIII.

Ma. 14, paragraphs 43, 44, 53 to 61, and Appendix XXIV.
Madras, Part XII.
Ma. 22, paragraphs 13, 14, 18 to 23.

NOTE.—Paragraph 55 refers by oversight to the wrong rules. The matter is taken up again in Madras, Part XII (Ma. 22), paragraph 20.

Particular attention is invited to the limits of flow which are claimed as useful and passed for use for purposes of irrigation through the Cauvery-Vennar regulators, (Ma. 14, paragraph 53) and to the figures in Appendix XXIV showing the quantities of water which the application of such limits to past years represents.

9. A few separate points to which special attention is invited are recorded below :—

(*a*) The actual operation of the rules of 1882 at the Upper Anicut involved waiting for a gauge reading of 7 feet on the Cauvery Dam before opening undersluices on more than half the occasions on which undersluices were opened. This was under the strict operation of rules and not under any exceptional regulation as contended by Mysore in My. 7, paragraph 43 and My. 9, paragraph 36.

Vide Ma. 8, paragraph 30
Ma. 9 „ 8
Ma. 12 „ 33
Ma. 14 „ 51

(*b*) Mysore have suggested that the alterations of rules for regulation at the Upper Anicut have been due to the altered conditions of the river-bed at the head of the Cauvery above the Cauvery Dam.

The plans showing the yearly surveys of the river-bed available from 1886 to 1910 which have been produced completely disprove the suggestion of alterations and show that there has been no alteration. The results are noted in Madras exhibits Ma. 17 and 17 (*a*) and (*b*).

(*c*) Suggestions have been made that remissions constitute a measure of loss sustained by deficient supplies of water. The Arbitrator has called for any statistics regarding such losses that are available ; statements of remissions and estimates of losses with the Jamabandi reports year by year for twenty years have been furnished in Ma. 20. It is claimed that it is clearly shown that great losses may be suffered by ryots when remission is insignificant—*vide* Madras Exhibit Ma. 20 and especially the Jamabandi report in the year 1890-1891, a year of small river supply and also small remission but of great loss to ryots.

(*d*) Statements without any proofs have been made constantly by Mysore that large quantities of water are under existing conditions constantly passed through the Cauvery and Vennar regulators for flood relief purposes.

The occasions under which water has been so passed since the existing control was obtained are shown in Madras Appendix XVIII (Ma. 12) and the Mysore allegations disproved.

The matter is dealt with in :—

Ma. 12—paragraphs 42 to 44.
Ma. 14— „ 57 to 61.
Part XII (Ma. 22), paragraphs 13, 14, 18 and 19.

10. It is claimed that, under the considerations alluded to above, the prescriptive rights of Madras in 1910 on considerations of the requirements and modes of

user for the Cauvery Delta system alone, are shown to amount to all natural flow in the Agunda Cauvery up to the limit flow which under the conditions existing prior to remodelling of the Upper Anicut was required to give a gauge reading of 7 feet on the Cauvery Dam with undersluices closed or 6½ feet with undersluices open.

LOWER ANICUT.

11. The conditions of supply of the Lower Anicut are and have been since the original construction of the Upper Anicut dependent on unregulated succession of floods and very fluctuating flow. Under the conditions which existed prior to remodelling of the Upper Anicut, such flow was much more frequent in incidence. In consequence of the remodelling of the Upper Anicut, the Lower Anicut had to be raised 2 feet to compensate for diminution of such frequent unregulated incidence of flow.

Mysore proposals involve great diminution of both incidence of flow giving unregulated supply into the Coleroon and of quantities and frequency of floods.

The conditions of supply are such that all floods give useful supply unless Veeranam tank is standing full, thus strictly in law prescriptive rights under such condition exist to all floods. The Madras Government recognise that such a claim would impose an unreasonable burden on Mysore and that claim to all floods is waived in consideration of the recognition that the great reduction of unregulated supplies, which are now the chief source of supply to the system, must be replaced by a specific extra allowance over and above what is now necessary for the Cauvery Delta system. The part of the system which suffers from deficient supply especially in the south-west monsoon is the Vadavar and Veeranam tank area (63,000 acres) and the conditions of supply to this part of the system are the key to the question of supply. This part is the one which suffers whenever supplies are deficient.

The conditions of supply of this system are not susceptible of brief and concise recapitulation and it is only by a study of the descriptions and statistics describing these conditions that a true understanding of this part of the problem can be obtained.

12. The Madras arguments, however, as regards it are mainly :—

(1) That even under existing conditions supplies in the south-west monsoon are frequently deficient and inadequate and the irrigation under Veeranam tank and the Vadavar therefore suffers.

(2) Under conditions restricting existing supplies which the Mysore proposals involve, allowance of specific quantities in excess of the limit flow required for Cauvery Delta is necessary for the Lower Coleroon system.

(3) The water claimed is included within the Madras prescriptive right for the Cauvery Delta system and required for purposes of scour at the Upper Anicut, and will, under Madras proposals, be diverted on to the fields of the Lower Coleroon area after such use, and form so much of the supply of the Lower Coleroon system as is dependent on Cauvery water.

13. The paragraphs on which Madras rely cannot be concisely detailed and involve the whole arguments, but the index of paragraphs will enable any specific item of description or argument to be readily traced.

14. Special attention is invited to the following :—

(*a*) The tables and description in Ma. 8, paragraphs 39 to 41 and Ma. 9, paragraphs 10 to 14, which show the existing conditions of supply of Veeranam tank and the Vadavar from the Coleroon.

(*b*) Ma. 8, paragraph 42 and Appendix IV, and Ma. 12, paragraphs 92 to 97, which show that, in the south-west monsoon, all the Vadavar " direct area" and most of the area under Veeranam tank can only be supplied from the Coleroon as the local rainfall is small and uncertain at this time.

(*c*) Ma. 14, paragraph 89, and Madras, Part XII, Ma. 22, paragraphs 35 to 39 where it is proved that failure in supplying water to the tank means postponing planting the ayacut and consequent loss to the ryots, though such loss does not ordinarily occasion remission of *kist* on the affected area.

(*d*) Ma. 12, paragraph 92, showing that the irrigating capacity of the Veeranam tank apart from the Coleroon is 10,000 acres whereas the area under it is 52,000 acres.

15. The claims of Madras as regards limit quantity of flow at the Upper Anicut will suffice to give sufficient water to the Lower Coleroon system under conditions now existing and the claim made has been restricted to this—My. 9, paragraphs 10 and 11.

Madras-Cauvery Channels above Upper Anicut.

16. Madras claim that for these channels alone it is necessary from June to November to preserve without diminution the natural flow up to a limit of 6½ feet Cauvery Dam, north gauge.

The contentions regarding this are stated in—

Ma. 14, paragraphs 100 to 104.

Madras, Part XII (Ma. 22), paragraphs 48 to 52.

Madras Exhibit Ma. 18 and 18-*a*, 18-*b*, 18-*c*.

Madras Exhibit Ma. 20.

Hot Weather Supply.

17. The Mysore Project provides for passing a continous and unfailing flow at Sivasamudram of 1,000 cusecs and the Madras Government claim that this is an integral part of the project under consideration and that Mysore should undertake that this shall be passed without intermission. To allow a working margin Madras place the minimum flow at 900 cusecs. Subject to this being passed, the Madras Government agree to Mysore impounding the whole flow of the river in the months of March, April and May.

Ma. 3, paragraphs 3 and 4.

Ma. 4, paragraphs 3 and 4.

Ma. 9, paragraph 22.

18. In the alternative, the Madras Government claim that they have right by prescription to the whole natural flow of the river in the hot weather months subject to a limit flow of 9,000 cusecs past Sivasamudram.

Madras, Part IV (Ma. 9), paragraph 21.

Madras, Part VI (Ma. 12), paragraph 99.

Madras XII (Ma. 22), paragraphs 40 to 47.

The latter is a modification of the original claim as regards "limit flow". The original claim (Ma. 4, paragraphs 3 and 4, clause 3) was that the limit should be a 7 ft. gauge at the Cauvery Dam.

19. In formulating claims for the whole natural flow upto a limit specified in the Agunda Cauvery at the Upper Anicut, the Madras Government waived their right to floods so far as these can be impounded under the project now under consideration. The limit claimed is covered by their prescriptive right for the supply of the Cauvery delta only, which limit flow, by means of improvements, partly made already, can be made to suffice for the supply also of the Lower Anicut system without detriment to existing irrigation.

Within the limits claimed the supply of the upper channels also will be protected.

20. *General considerations.*—This is not a case in which each party puts forward proposals for a project in which some compromise of the nature of give and take would be reasonable.

This is not a case for compromise. Any concession which infringes on the interests of Madras is a deprivation to existing and well established interests of the Madras Government and Madras ryots.

The ordinary compromise which gives a little to each side is not justly applicable to a case in which the interests of one side are actually existent and well-established while those of the other are merely prospective. Madras claim that their existing rights shall be *fully* safeguarded, and that in cases of doubt they are entitled to have the benefit of that doubt and their existing rights protected, not only from injury but from all risk of injury.

Ma. 9, paragraphs 4 and 5.
Ma. 10, paragraph 80.
Ma. 12, ,, 70.
Ma. 83, ,, 25.

W. M. ELLIS, COL., R.E.,
Representative of Madras Government.

5th February 1914.

Exhibit Ma. 23-a.

Index to paragraphs, Mysore-Madras-Cauvery Arbitration.

Catchword precis	Madras Part I, Ma. 7	Mysore Part I, My. 6	Madras Part V, Ma. 11	Mysore Part I, My. 9	Madras Part VIII, Ma. 14	Mysore Part I, My. 12	Madras Part XI, Ma. 22	Reference to appendices (Ma. or My.)
Legal arguments.								
Points raised by second issue	2	...	...	...	...	...	...	...
Indefiniteness of first issue	3	...	...	...	...	3	1 (*c*)	...
1910 is the year to be considered in determining the existing right of Madras	4	7	...	...	...	2	1 (*a*)	...
Scope of arbitration	5	...	...	...	...	...	...	...
Question to be decided—"Extent" of Madras rights or consent to particular reservoir	6	8	...	...	...	5	1 (*c*)	...
Contention about the claim of "unlimited natural right" and Madras reply that the agreement precludes this contention based on the unlimited natural right	13	10	2 and 3	...	...	...	1 (*c*)	...
Remarks on Sir K. Sheshadri Iyer's memorandum.								
Application and effect of "Fair and reasonable"	7	9	4	...	...	6 and 25	1 (*c*), (*f*) 5	...
Memorandum of Sir K. Sheshadri Iyer and certain observations on Sir K. Sheshadri Iyer's memorandum as to the object of the Agreement of 1892	8 to 10	3, 10 and 17	1, 2	...	...	...	1 (*c*)	A (Ma. 11). A (My. 6).
Interpretation of "prescriptive right" and "law of prescription" Madras interpretation on the result of "prescription," common law "prescription" or statutory "prescription" and period of enjoyment. Arguments against applicability of statutory rules. Principles in determining loss of "prescriptive rights" ...	11, 18, 19 and 20, 25	2, 5, 6, 7 and 10 12	5	2	3 and 17, 16	9 and 24, 23	1 (*g*) 2 (*ii*) (*iii*) (*iv*)	(My. 9) Q. paras 4, 5, 6, 7 and 8
Reasons for the application of international law in the Memorandum of Sir K. Sheshadri Iyer	12	...	...	...	..	...	...	...
"Riparian rights" theory in international law and Privy Council on the extent of this right. Certain cases in Harvard Law Review about the law of Riparian rights being applicable to the relation of two independent States. Agreement fair and intelligible on the basis of "riparian rights" theory	14 and 16	10	...	...	2	7	1 (*g*)	Q./1 and 3
Argument of "permissive" user in the past, suggested to be entered by Sir K. Sheshadri Iyer. Cites certain cases from I. L. R. 11, Madras	15	...	...	...	2	4	1 (*d*)	Q./2

Index to paragraphs, Mysore-Madras-Cauvery Arbitration—*concld.*

Catchword precis	Madras Part I, Ma. 7	Mysore Part I, My. 6	Madras Part V, Ma. 11	Mysore Part I, My. 9	Madras Part VIII, Ma. 14	Mysore Part I, My. 12	Madras Part XI, Ma. 22	Reference to appendices (Ma. or My.)
Legal arguments—concld.								
Argument of Mysore on non-user and Madras contend that this applies to absolute non-user and not partial user	21	11 and 16	4, 6 and 7	1, 3, 4	...	6	1 (*f*)	...
Arguments based on joint possession prior to rendition and principles of Section 13 of Easement Act. Joint occupation does not destroy pre-existing rights	30	15, 21 and 22	8 and 13	5, 10	3	4	1 (*d*)	Q./12
Mysore's general arguments on limitations stated and Madras reply that they are entitled to the supply of water actually used for irrigation of area in 1890. Madras have to prove that certain quantity was used peacefully and uninterruptedly for twenty years ...	22	17	9	...	...	17	3 (iii)	...
Limit of hot weather flow and "average estimated natural flow" ...	...	...	...	...	...	10 to 16	6	...
No total cessation of the exercise of the right and no abandonment of the immemorial right of Madras and some cases from 14 M. and W. 789 cited.	26 to 29	...	...	...	...	...	2 (iv)	Q./10 and 11
Mysore contend that Madras lost the prescriptive right after the remodelling of the Upper Anikat. The fundamental fallacy underlying this argument. Works existed in 1836. Subsequent improvements to Upper Anikat simply diverted the excess flow that was passing into the Coleroon, in the Cauvery and thus facilitated efficient distribution of water to the existing wet lands that had been suffering. Limit flow of seven feet on the Cauvery dam. This limit only was used in the irrigation of lands though excess in acreage. Mysore's contention that law of prescription applies only to water actually used and not that wasted into the sea	23, 24, 31 to 36, 37 to 42, 43 to 46	12 to 15, 21	6, 7, 10 to 12	3, 4, 7 to 9	4, 5, 6 to 13 17 to 28	2, 18 to 22, 26, 27, 28, 25	1 (*b*) and (*g*) 2 (i), (ii) 3 and 4, 5	Q./13, Q./15, Q./14
Objection of Mysore to the supply of water for Coleroon irrigation and Veeranam tank and reduction in the canal supply is to be allowed on account of rainfall. Madras reply that, as rain is an uncertain factor, this need not be taken into account	...	...	...	...	...	..	...	...
Nature of user	...	18	...	...	...	...	...	...
Reciprocal rights of Madras and Mysore and recent irrigation developments	...	4 and 19	3	...	...	...	...	...
Place of measurement	...	20	...	...	...	...	...	...
Previous history	...	1	...	...	...	...	...	...

Exhibit Ma. 23-b.

SECOND ISSUE—FACTS AND ENGINEERING ARGUMENTS.

Index to paragraphs.

Catchword precis	Madras Part II, Ma. 8	Madras Part III, Ma. 9	Mysore Part II, My. 7	Madras Part VI, Ma. 12	Mysore Part II, My. 9	Madras Part IX, Ma. 14	Mysore Part II, My. 12	Reference to appendices, Ma. or My.
Character of rainfall in the Cauvery basin	1	...	...	...	...	...	...	...
Supplies in the south-west monsoon dependent on hill catchments and the flow of the Cauvery in this monsoon	2 and 4	...	...	...	...	...	...	...
Rainfall in the north-east monsoon is variable and conditions of flow in this monsoon	3, 5 and 6	...	...	...	...	...	...	...
Forecast of the character of the season is impossible	7	...	...	...	...	...	...	...
Large area under the direct irrigation by the Cauvery: Madras irrigation above and below the confluence of the Bhavani; delta irrigation under the Cauvery (Appendix III)	8, 11, 12 and 13	...	...	...	...	...	...	III
Supplies in bad years compared with minimum estimated requirements and the necessity for receiving all water now delivered for irrigation	9 and 10	...	...	...	...	...	...	...
General description of river branches below Upper Anicut	14	...	73	...	...	...	...	...
Original construction of Grand Anicut and alterations to this ...	15 and 20	...	...	...	...	...	...	..
Construction of Upper Anicut in 1836, 1845 and in 1899 to 1902 and of 150 yards calingulah; altered conditions through remodelling of the Upper Anicut	16 to 18, 32, 33	7	...	..	31 and 82	...	...	...
Bridges and regulators at the old Vennar head and construction of Cauvery-Vennar regulators and new Vennar head	19 and 22	...	...	...	...	...	...	...
Construction of Lower Anicut, 1836	21	...	...	...	...	...	...	...
Remodelling of Upper, Lower and Grand Anicuts, 1899-1902. Proposed arrangements and irrigation conditions under each, both before and after remodelling	23 to 28	..	...	...	82	...	...	...
Rules for regulation of Upper Anicut before remodelling and general conditions of the Cauvery delta supply under rules of 1882 and 1896 (Appendix I)	29 to 31, 34	...	42	22, 27, 33 and 95	...	38 and 51	...	I
Description and working conditions of Lower Anicut prior to and after remodelling. Reasons for such remodelling. Description of the Vadavar channel	35 to 41	7, 10 and 33	74 and 77	97	70 and 81	93	33	I
Veeranam tank water registers (Appendix IV)	42	...	74	...	...	...	...	IV
Conditions of irrigation and regulation at Grand Anicut; description of Grand Anicut prior to remodelling; remarks on the conditions of working of Grand Anicut before and after remodelling (Appendices I and II)	43 to 47	...	...	...	39	...	...	II

Index to paragraphs—*contd.*

Catchword precis	Madras Part III, Ma. 9	Mysore Part II, My. 7	Madras Part VI, Ma. 12	Mysore Part II, My. 9	Madras Part IX, Ma. 14	Mysore Part II, My. 12	Madras Part XII, Ma. 22	Reference to appendices, Ma. or My.
Area of Madras Irrigation under the Cauvery and proposed extensions of irrigation in Mysore. Mysore states that 176,324 acres has been given in 1890 as irrigated under Upper Anicut whereas 208,628 acres was given in 1910. Madras should not claim prescriptive right for the area in excess, *i.e.*, 32,289 acres. Madras contend that the figures are those given by Collectors and explain the reason for such increase. Area irrigated under Lower Anicut and this area was taken from G. O. No. 400—I. of September 1909 communicated to Mysore	2 and 3	24, 25 and 27	2 to 9 and 10	15 to 19	30 to 35	30 to 33	8, 9 and 10	XV, S, XXI, XXVI
Comparison of Madras existing interests with Mysore prospective interests	4	...	...	...	...	...	...	...
Existing right to be fully safeguarded...	5 and 6	...	...	...	...	...	...	...
Consideration of Madras prescriptive rights before remodelling of Upper Anicut	7	28 and 29	11	20	36	34	5	...
Claim of 7 feet supply on the Cauvery Dam to Cauvery system for silt clearance. Full prescriptive right not claimed by Madras but asks for 7 feet supply on the Cauvery dam. Contention put forward by Mysore regarding this limit flow at Upper Anicut ...	8, 11, 13 and 24	30 to 32, 42, 43 and 69	12 to 14, 30 to 33	21 to 23, 34 to 36	37 to 39	35 to 37	11	...
Alteration to Vadavar and Veeranam to increase the capacity of the tank to irrigate Shatiatope system also.	12	...	...	...	...	...	...	...
Claims of supply made at Upper Anicut include provision for supply at the Lower Anicut. Also for irrigation of area above Upper Anicut and water required for this irrigation.	14, 15, 23, 19 and 20	26	10	...	...	...	...	III
Water for scour a necessity and arguments regarding scour conditions	9	40 to 43	25 to 32	30 and 35	38, 45 to 50	41 to 43	15, 16, 11, 17	...
Proofs on which Madras rely (*i.e.*, water registers and rules for regulation of water) and rules for regulation indicate system of use and enjoyment.	16 and 18	...	...	...	...	...	...	I
Limited power of regulation prior to remodelling	17	...	...	...	...	...	...	...
Madras prescriptive right to hot weather flow and Madras state that they are prepared to waive their right to the whole natural flow of the river if 900 cusecs is passed down to Madras. Mysore state that there is no hot weather irrigation in Madras and so Madras waived their claims. If the waiver is withdrawn, Madras is entitled to the whole natural flow after the customary requirements of Mysore. Madras reply if 900 cusecs is not sent down, the whole hot weather flow will be claimed by Madras. Areas of hot weather irrigation, etc.	21 and 22	78	50 and 99	88	99	72 to 75	42 to 47	XXVII, XXVIII
Table and statistics show flow under Mysore proposals. Madras states that disastrous results will follow if the Mysore proposals are accepted								
Mysore proposals do not conserve unimpaired Madras rights and Madras' reasons for this statement. Loss due to inadequate supply and consequently the result is grant of large remissions year by year. Mysore contend that loss was due to inundations and Madras say in reply that remissions on account of failure of crops exceed those on account of inundations and remissions are not generally given on account of partial failure of crops. Madras state that it is reported in the triennial report that remissions are given on account of inundations. Some discrepancies in the discharges noted in the Administration Report and Madras explain the inaccuracy in these figures. Discharges of the Cauvery-Vennar regulators and Assessor's curve	25, 27	61, 62, 32	53 and 54 55 to 58	53 54 to 64	66 67 to 77	53 to 60	25 to 31	XXII, XXIV G, H, P (11) G-1

Catch word precis	Madras Part III, Ma. 9	Mysore Part II, My. 7	Madras Part VI, Ma. 12	Mysore Part II, My. 9	Madras Part IX, Ma. 14	Mysore Part II, My. 12	Madras Part XII, Ma. 22	Reference to appendices, Ma. or My.
Admission by Mysore regarding the uniform depth of flow allowed in the Metur Project and the percentages allowed on it for uncertain and unsteady flow	26	60	52	52	65	...	...	...
Special allowances for rainfall in the north-east monsoon proposed by Mysore. Consideration governing such allowances for rainfall. Allowance for rainfall impracticable. Reference to Madras Project as regards rainfall and conclusions regarding such allowances; substantial reduction in canal supply is possible on account of rainfall	28, 29, 30, 31, 32	65	71	69	82	63	34	E and H
Specific supplies required for Coleroon system (paragraphs 35 to 41, Part II)	10 and 33	...	...	...	...	...	...	...
Places of freshes surplusing Grand Anicut and Upper Anicut ...	37	...	...	...	...	...	...	...
Discharges of 150 yards calingulah; uncontrolled freshes and floods are passed into this. Mysore contend thot freshes and floods now enjoyed by Madras and passed into the Coleroon should be impounded in Mysore Reservoir and no specific supplies given in their place and Madras reply that the supplies to Vadavar and Veeranam tank are sometimes inadequate even frequently under existing conditions of flood and surplus into the Coleroon made in place of impounded floods	34	44 and 45	34	46	59 and 60	50	23	XXII XVIII
Mysore state that the early freshes of June are wasted into the sea and Madras reply that a portion is used in the absorption of channel and canal beds; the balance is used in watering seed-beds, etc , loss in transmission, etc.. and so this cannot be taken as waste. Thus the Mysore statement is incorrect in support of which Madras furnish facts and figures. Mysore state some percentages allowed in the Metur Project report on account of absorption in channel and canal beds represent the distance between reservoir and canal bed (Grand Anicut) and do not include distances throughout	36, 38 and 39	57	50, 51	49 to 51	63 and 64	51, 52	24	D
Mysore object that supplies for irrigation under Veeranam tank have been brought in for the first time and Madras reply that this is part of Coleroon system and quote reasons for not specifying this..	35	(See also My. 4, paragraph 12)			...	...	...	VII
Inaccuracy in the discharges recorded prior to 1909 and discharges recorded in Madras Project report are based on the carefully conducted gaugings in 1909	40	...	...	...	...	...	...	...
Irrigation under Cauvery channels above Upper Anicut and the area irrigated under them	...	...	...	...	100 to 106	76 to 81	48 to 52	...
Area irrigated below Upper Anicut	41	...	...	...	...	...	...	...
Madras prescriptive right established by the rules of regulation in force and this has been expressed by Sir J. Benton. Mysore contend that bad years should not be taken in fixing limits of flow required and thus high limits of flow should not be demanded with a view to avoid remissions	42	63 and 64	59 to 70	45 and 65 to 68	58 and 78 to 81	61 and 62	32 and 33	XVII, E. G.
References made by Mysore regarding opinions expressed and proposals made in the Madras project. Madras state that there is no objection to this if a continuous and unfailing supply to meet the requirements of Madras irrigation is given from the Mysore impounded supplies. Mysore contend that no such uniform supply is provided in the Metur project and different limits are proposed for various months of the year	43	56	48 and 49	48	62	...	...	...
Summing up of Madras claims	44	...	...	...	...	...	...	...

Index to paragraphs—*concld.*

Catchword precis	Madras Part III, Ma. 9	Mysore Part II, My. 7	Madras Part VI, Ma. 12	Mysore Part II, My. 9	Madras Part IX, Ma. 14	Mysore Part II, My. 12	Madras Part XII, Ma. 22	Reference to appendices, Ma. or My.
Limit of considerations of prescriptive rights of Madras	...	23	1	12 to 14	29	29	7	...
States 6 feet is the correct limit of supply to Madras and quotes evidences in support of this from Mr. Larminie, Major Oakes and Bhavani project reports and from Upper Anicut conditions and also from Metur project report. States that 6·0 on the gauge mentioned in rule 2 of 1882 rules for regulation represents the limit of full supply to delta (paragraph 4, My. 9). Mysore remark that 6 feet is quite adequate as the crest of the level of the old anicut of the Coleroon was raised 2 feet higher	...	33 to 41, 53, 55, 58, 59, 66, 67	15 to 24, 45, 47, 52, 72 to 75, 91	24 to 33, 36 to 43, 47, 70 to 73	40 to 42, 45 to 49, 51 to 56, 83 to 86, 61	38, 41, 42, 44 to 48, 50	11, 12, 15, 16, 18 to 21, 23	I, XVI, VI, XV, VIII, XXI, XXIII, XVIII, XXIV
Meaning of the expression "full and ample" in rules of 1888 and interpretation of other clauses. (Also paragraph 45, Part II, Ma. 8)	...	46 to 50	35 to 41	28, 29	43, 44	39, 40	13, 14	XVII, D, VIII XVIII
Explanation of excess discharges through Cauvery and Vennar regulators	...	51	42 to 44	44 to 46	57 to 61	49, 50	22, 23	VI, VIII, XVIII
Mysore remark that the increase of limit flow in the Lower Anicut for the safety of this anicut when the floods in the Coleroon rise is no contention for the supplies in excess of limit required for delta irrigation	...	52	42	44	57	49	22	XVIII
Excess quantity passed during floods is no criterion of actual requirements	...	54	46	...	...	...	...	XVIII
General consideration against the claims and certain remarks of Mysore on the *minus* figures shown under "leakage, etc." ...	...	68	76 to 87	74 to 82	87 to 94	64 to 70	35 to 40	V, K-1, K, T and XXV
Interception of floods by the Mysore reservoir is immaterial ...	...	70	88 to 90	83, 84	95	71	41	T, W
Detailed examination of the claims for irrigation to areas under Veeranam tank and replenishments from the Veeranam tank catchment. Mysore state that Veeranam tank can irrigate 30,000 acres by rainfall in the catchment and the balance by the Vadavar (22,000 acres)	...	71, 72	91, 92	85	96	71	41	T, W
Inferences from the Madras statement (paragraph 38 of Part II, regarding the filling of the Veeranam tank and Mysore state that the extra flow of 644 million cubic feet per day required for filling the Veeranam tank is untenable	...	76	97	...	...	...	...	...
Net supply required through the Vadavar and the interpretation of the rules in support of this. Mysore contend that the irrigation under Veeranam tank will be unaffected if the tank fills or not. (Part II, paragraphs 37 to 42 of Madras and table on page 14 and Appendix IV and Mysore Appendix K and L)	...	73 to 75	93 to 96	85	96	71	41	T, IV, K, L and W
Remodelling of Lower Anicut has no effect on the controlling of the floods through the Coleroon and this would have fared well, had sill been raised instead of being lowered in replenishing the Veeranam tank ... ... (Paragraph 41, part II of Madras.)	...	77	98	86, 87	97, 98	71	41	T, W

MADRAS APPENDICES.

Subject of the appendices	Madras Part II, Ma. 8	Madras Part III, Ma. 9	Madras Part VI, Ma. 12	Madras Part IX, Ma. 14	Mysore case, My. 7	Mysore case, My. 9	Mysore case, My. 12	Madras Part XII, Ma. 22
Ma. 8 and 9 (I)—Rules of regulation of the Upper, Lower and Grand Anicuts	29, 41	16	27	...	...	...	...	15 and 20
Ma. 8 and 9 (II)—Table showing occasions of carrying water in the Cauvery and Vennar at depth exceeding full supply stated in the rules	47	...	42	53	51, 52	...	...	This table has been superseded by that in Appendix XVIII
Ma. 8 and 9 (III)—List of channels taking off from the Cauvery between the Upper Anicut and the Bhavani and areas irrigated	12	19	...	...	...	...	...	...
Ma. 8 and 9 (IV)—Statement of water levels, the Veeranam tank, 1890 to 1909	42	...	...	...	75	...	...	...
Ma. 9 (V)—Diagram showing area charged as irrigated in the Cauvery delta and the Lower Coleroon Anicut systems ...	...	...	76	...	...	...	...	...
Ma. 8 and 9 (VI)—Gauge readings, north gauge, the Cauvery dam 1880 to 1909	...	...	41 and 44	...	...	...	...	...
Ma. 8 and 9 (VII)—Provisional rules defining the method of passing down supplies required for irrigation in the Madras Presidency	...	35	...	...	...	...	...	...
Ma. 8 and 9 (VIII)—Daily register—Front and rear gauge readings, Cauvery and Vennar from 1890 to 1910, June to January	...	...	37, 44	56	...	...	...	...
Ma. 10 (IX)—Note by Col. Ellis on computations of discharges at Sivasamudram								
Ma. 10 (X)—Table of discharges of the Cauvery by float observations at Danakere and corresponding discharges at Sivasamudram, Bhavani Bridge, and Upper Anicut					Refers to third issue.			
Ma. 10 (XI)—Extract from register of discharges of the Cauvery at Sivasamudram and Upper Anicut								
Ma. 10 (XII)—Extract from registers of discharges of the Cauvery at Sivasamudram and Bhavani Bridge								
Ma. 10 (XIII)—Tables M and N showing working Mysore system of regulation					Refers to third issue.			
Ma. 10 (XIV)—Table showing discharges of the Cauvery at Sivasamudram, Bhavani Bridge and Upper Anicut, 1902 to 1909, June to September								

MADRAS APPENDICES—*concld.*

Subject of the appendices	Madras Part II, Ma. 8	Madras Part III, Ma. 9	Madras Part VI, Ma. 12	Madras Part IX, Ma. 14	Mysore case, My. 7	Mysore case, My. 9	Mysore case, My. 12	Madras Part XII, Ma. 22
Ma. 12 (XV)—Statement showing the area of irrigation under the Cauvery and its tributaries above the Upper Anicut for years 1890, 1895, 1900, 1905 and 1910.	...	...	6	...	25, 26	32	...	...
Ma. 12 (XVI)—Copy of demi-official letter from the Joint Secretary to the Government of Madras to the Inspector-General of Irrigation, dated 18th September 1911 ...	...	...	15	...	...	...	...	...
Ma. 12 (XVII)—Comparative statement of annual discharges of the Cauvery and Vennar in m.c.ft., June to January, 1890 to 1910	...	...	41, 61, 63 and 66	...	...	...	...	...
Ma. 12 (XVIII)—Table showing occasions of carrying water in Cauvery and Vennar at depth exceeding full supply stated in the rules of regulation in force	...	...	42 and 46	44, 53, 54, 56 and 57	...	46	...	13, 22
Ma. 13 (XIX)—Table III-A			Third issue	only.				
Ma. 13 (XX)—Extract from "Madras" Mail, dated 19th May 1913 ...			Refers to third	issue only.				
Ma. 14 (XXII)—Statement showing the area irrigated by the channels and tanks fed by the Cauvery and its tributaries above Upper Anicut for 1880 to 1889	...	...	...	31	...	32	...	...
Ma. 14 (XXII)—Note regarding figures of "Average discharge at head." Appendix V of Sir J. Benton's note of 12th May 1911 (Ma. 8-a)	...	...	...	59 and 70	...	...	...	...
Ma. 14 (XXIII)—Note on the differences of discharges for the same gauge readings, Cauvery Dam, recorded in the curves of Captain Mead and Major Montgomerie...	...	...	...	52	...	...	...	...
Ma. 14 (XXIV)—Table of discharges, Cauvery Dam, from the curve of 1909 and of the Cauvery-Vennar regulators from the Assessor's curve	...	...	...	53, 72, 73, 75 and 76	...	55, 57 and 59	...	22, 28 and 31
Ma. 14 (XXV)—Table revising and amplifying Appendix K (My. 7) ...	...	...	...	90	...	...	...	38
Ma. 22 (XXVI)—Extract from G. O. No. 400—I, dated 24th September 1909	...	...	...	...	...	...	...	10
Ma. 22 (XXVII)—Statement of daily discharges in excess of 1,000 cusecs of the Cauvery at Bhavani bridge and Sivasamudram for years 1902 to 1908, March to May, A, B and C	...	...	...	...	...	...	...	43
Ma. 22 (XXVIII)—Statement of area of hot weather irrigation in Trichinopoly District	...	...	...	...	...	...	...	45

Exhibit My. 17.

I

Statement showing the area of wet cultivation of the river Cauvery and its channels above the Reservoir site.

Year	Paddy or Monsoon crop										Sugarcane and garden or perennial crop									
	Sriramadevar North and South channels	Mandagiri	Hemagiri	Kalhalli Kannambadi channel	Krishnarajakatte	Chamaraj and Mirle series	Ramasamudram	Marchalli	Tippur Nalla	Total	Sriramadevar North and South channels	Mandagiri	Hemagiri	Kalhalli Kannambadi channel	Krishnarajakatte	Chamaraj and Mirle series	Ramasamudram	Marchalli	Tippur Nalla	Total
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.		Acs.	Acs.
1896	5,728	3,112	1,067	1,385	4,700	5,200	5,861	410	815	28,278	927	572	424	175	927	1,120	374		194	4,713
1897	5,932	3,086	1,075	2,303	4,700	5,200	5,872	410	815	29,393	959	598	416	180	959	1,120	374		194	4,800
1898	7,195	3,073	1,090	2,596	4,947	5,200	5,872	410	815	31,198	809	735	409	130	809	1,120	380		194	4,586
1899	7,044	3,082	1,064	2,596	4,953	5,200	5,872	410	815	31,036	944	726	435	130	944	1,120	380		194	4,873
1900	7,148	3,084	1,035	2,601	4,954	5,200	5,872	410	814	31,118	895	724	464	125	895	1,120	381		195	4,799
1901	6,927	3,106	...	2,601	4,957	9,952	5,872	410	814	34,639	1,114	702	27	125	1,114	1,152	381		195	4,810
1902	6,657	2,356	...	2,148	4,957	9,952	5,872	410	814	33,166	1,346	889	27	125	1,346	1,152	381		195	5,461
1903	6,361	2,373	...	2,113	4,957	9,952	5,872	410	814	32,852	1,667	872	27	160	1,667	1,152	381		195	6,121
1904	6,854	2,403	...	2,135	4,945	9,954	5,872	410	814	33,387	1,120	842	27	138	1,120	1,152	380		195	4,974
1905	6,818	2,387	898	2,114	4,953	9,951	5,872	410	814	34,220	1,127	864	484	159	1,127	1,152	380		195	5,488
1906	7,254	2,470	908	2,125	4,953	9,954	5,872	410	814	34,760	725	775	474	148	725	1,152	380		195	4,574
1907	7,211	2,475	893	2,132	4,962	9,978	5,872	410	814	34,747	740	771	489	141	740	1,183	382		195	4,641
1908	7,725	2,942	915	2,488	4,962	9,961	5,872	401	814	36,100	909	739	467	128	909	1,179	382		195	4,908
1909	7,616	2,841	900	2,488	4,963	9,999	5,872	405	814	35,928	848	840	482	128	848	1,188	382		195	4,911
1910	7,591	2,787	913	2,488	4,961	9,999	5,872	405	814	35,833	886	891	469	128	886	1,191	382		195	5,031

Nil.

N.B.—Information is not readily available for some channels and they are therefore not included in this statement.

II

Statement showing the area of wet cultivation of the river Cauvery and its channels below the Reservoir site.

Year	Paddy or Monsoon crop									Sugarcane and garden or perennial crop									Remarks
	Chik Devaroy Sagar	Ramaswamy	Mahadeva Mantri	Devaroy	Virjanadi	Bangara Doddi	Rajaparameswari	Rampur and Hulhalli	Total	Chik Devaroy Sagar	Ramaswamy	Mahadeva Mantri	Devaroy	Virjanadi	Bangara Doddi	Rajaparameswari	Rampur and Hulhalli	Total	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.	
1896	14,627	7,398	2,332	1,202	6,334	763	3,285	5,432	41,373	2,406	246	65	...	...	...	76	84	2,877	Figures incomplete.
1897	14,628	7,338	2,621	1,202	6,330	763	3,285	6,222	42,389	1,838	255	94	...	...	...	76	236	2,499	Do
1898	14,627	7,366	2,620	1,202	6,332	763	3,285	6,478	42,673	1,146	246	94	...	...	...	76	236	1,798	Do
1899	13,485	8,085	2,722	1,109	6,069	582	3,583	7,146	42,781	1,896	247	94	92	263	180	76	236	3,024	
1900	13,488	8,088	2,750	1,109	6,069	582	3,583	7,422	43,091	1,826	248	94	92	263	180	76	324	3,103	
1901	13,516	8,074	2,744	1,109	6,069	582	3,583	7,422	43,099	1,825	246	94	92	263	180	76	324	3,100	
1902	13,516	8,179	2,745	1,109	6,073	582	3,583	7,615	43,402	2,505	245	94	92	263	180	76	324	3,779	
1903	13,518	8,144	2,998	1,126	6,068	582	3,584	7,807	43,827	2,501	244	82	92	263	180	76	324	3,762	
1904	13,589	8,165	2,981	1,126	6,084	582	3,584	8,759	44,870	1,222	248	82	92	263	180	76	324	2,487	
1905	13,589	8,159	2,973	1,126	6,085	582	3,584	9,520	45,618	1,222	215	82	92	263	180	76	324	2,487	
1906	13,577	8,165	2,980	1,126	6,085	581	3,584	9,752	45,850	1,221	243	82	91	263	180	76	324	2,483	
1907	13,577	8,118	2,978	1,126	6,085	581	3,584	10,559	46,608	1,221	247	82	91	263	180	76	324	2,487	
1908	13,581	8,182	3,017	1,127	6,090	581	3,590	10,620	46,788	1,221	245	82	91	263	180	76	324	2,485	
1909	13,586	8,183	3,015	1,127	6,092	581	3,595	10,662	46,841	1,221	248	82	91	263	180	76	324	2,488	
1910	13,591	8,102	2,998	1,127	6,092	581	3,595	10,763	46,849	1,221	246	82	91	263	180	76	324	2,486	

N.B.—Information is not readily available for some channels and they are therefore not included in this statement.

1

Exhibit. My. 18.

Number of appendix	Heading	Reference to paragraphs of Exhibits	Brief description of the object of the Appendix
A.	Sir K. Sheshadri Iyer's letter and memorandum of June 1890.	My. 6, paragraph 2 ...	The circumstances that led to the Agreement of 1892 are briefly related here. It also shows that the object of the Agreement was to avert the consequences of loss to the British Government without checking the legitimate and reasonable progress of the Irrigation works of Mysore.
B.	Rules for the regulation of water at Upper Anicut, dated July 1882.	My. 7, paragraphs 40 and 41 ... My. 9, paragraphs 28 to 36 ...	Six feet on the Cauvery dam has been the full supply limit prior to remodelling and not 7 feet as claimed by Madras. The rules distinctly state that the scouring sluices should not be opened ordinarily until water rises to 6½ feet and at times of scarcity to 7 feet on the Cauvery dam. Hence no claim to scouring water can arise at 6 feet.
C.	Rules for regulation at Cauvery-Vennar regulators, dated April 1888 and revised rules, dated August 1891.	My. 7, paragraphs 44, 45, 46, 47, 48, 49 and 53. My. 9, paragraphs 38, 39, 40, 41, 42, 43 and 44.	These rules confirm that less than the equivalent of 6 feet (5·8 feet) on the Cauvery dam was considered the full and ample supply to the Delta.
D.	Table of discharges in million cubic feet in the month of June for the years 1890 to 1909.	My. 7, paragraph 57 ... My. 9, paragraph 49 ...	Proves that the floods in the month of June are mostly wasted and that much of the water admitted into the Delta finds its way into the Coleroon below the Grand Anicut.
E.	Provisional rules for working the Mysore Reservoir.	.....	The method of impounding in the Mysore Reservoir so as not to infringe on the rights of Madras is fully given here.
F.	Statement showing areas irrigated as compared with supplies under different conditions.	My. 7, paragraph 62 ...	This appendix proves that, though there is a large variation in the quantity of water supplied to the Delta, there has been no great variation in the area cultivated from year to year, thus establishing that much more water than is actually necessary has been thrown on the cultivated area.
G.	Table showing quantities of flood that would have been available for Madras irrigation with the limits proposed by Mysore.	My. 7, paragraph 64 ... My. 9, paragraphs 61 to 76 ...	A comparison between the quantities actually used according to Sir J. Benton's Appendix V and those that would have been obtained with the limits proposed by Mysore has been made.
G1.	Statement of fortnightly discharges of the rivers Cauvery and Vennar limited to a discharge of 11,350 cusecs in the Cauvery and 6,100 in the Vennar.	My. 9, paragraph 61 ...	This table shows that the total quantities realized with the Mysore limits compare favourably with those obtained within the full and ample supply limits of the rules of 1888 (Appendix C).
H.	Tentative rules for making allowance for rainfall.	My. 7, paragraph 65 ... My. 9, paragraph 69 ...	This appendix gives the rules for relaxing the limits at times when canal supply is not required for the Delta lands.
K & K1	Statement of discharge in the Coleroon showing the quantities used for irrigation of the Lower Anicut system.	My. 7, paragraphs 68 (2), 75 ... My. 9, paragraphs 77 to 80 and 85 ... My. 12, paragraphs 66 to 70 ...	The tables in this appendix prove that the flow in the Lower Anicut canals, such as it was, has been maintained by means of leakage, seepage, etc.; that the flow utilized through the Vadavar to the direct irrigation under it and the Veeranam tank has been very little; and that the quantity impounded in the Veeranam tank has been practically nothing even though large quantities were surplussed into the sea at the same time.
L.	Abstract of Appendix IV of Madras case showing the conditions of Veeranam tank and the area irrigated under the Coleroon for the twenty years ending 1909-10.	My. 7, paragraph 75 ...	Shows that whether the Veeranam tank fills or not in the south-west monsoon the irrigation under it has been maintained more or less uniformly.
M.	Discharges of the rivers the Bhavani, the Amaravati and the Noyel.	My. 7, paragraph 84 ...	Proves that the replenishment below the Mysore territory from the tributaries, Bhavani, Amaravati and the Noyel amounts to about twice the capacity of the Kannambadi Reservoir even in a very bad year like 1905.
N.	Madras table N improved ...	My. 8, paragraph 92 ...	These are tables exemplifying the results of impounding according to the method originally put forward by Mysore, but subsequently rejected.

EXHIBIT MY. 18—*concld.*

Number of appendix	Heading	Reference to paragraphs of Exhibits	Brief description of the object of the Appendix
P.	Working tables I, II and III ..	My. 8, paragraphs 104 to 107 ... My. 9, paragraphs 104, 105 and 106	The tables here indicate the results of working according to the revised rules proposed by Mysore (Appendix E).
Q.	Brief notes on cases quoted by Madras.	My. 9, paragraph 11 ...	This appendix shows that the cases quoted by Madras in their legal arguments have little or no bearing on the points in dispute.
R.	Comparative table showing the effect on the quantity and incidence of the flow at the Cauvery dam.	My. 9, paragraphs 107 to 117 ...	This appendix clearly shows that the effect of impounding in the Mysore Reservoir on the quantity and incidence of flow at Cauvery dam is of an insignificant character and that any of the slightest disturbances observed are at once remedied by abundant flow available on the immediately succeeding days and that the days of impounding in any year are mostly confined to July and August and that the passing on of compensation water will be necessitated for a very few days and that the quantity of compensation water is also negligible.
S.	Statement showing the area irrigated by the Cauvery (and its tributaries), channels above the Upper Anicut.	My. 12, paragraph 32 ...	This appendix shows that there have been considerable extensions in the area irrigated since 1890 thus indicating that this extra area cannot claim water as a prescriptive right.
T.	Table III for the year 1899 ...	My. 12, paragraphs 71, 91 to 100 ...	The table shows that the appearance of minus quantities and the necessity of passing on of compensation water are no grave defects in the method of impounding proposed by Mysore as these factors will have no appreciable effect on the Delta irrigation as well as the irrigation under the upper channels.
W.	Abstract of discharges at the Lower Anicut.	My. 12, paragraph 71 ...	This appendix shows that in the worst year 1899 as much as 55,000 million cubic feet was uselessly surplussed into the sea at the Lower Anicut.

Exhibit My. 19.

Note on the quantity of water to be issued for power generation from the storage of the Kannambadi Reservoir for preparing the working tables.

The provision made in the Project for meeting the ultimate power requirements is 1,000 cusecs at the Reservoir, including the credit due to the river flow at Sivasamudram; and the net quantity to be drawn-off from the Reservoir is (14,256—7,904=) 6,352 million cubic feet as clearly shown in the foot-note No. 2 on page 31 of the printed Project and in columns B and A of the table on the same page. Also, in paragraph 18 (page 4) of the Chief Engineer's Report, the "stored water" required for power is taken as 6,352 million cubic feet agreeably to the table noted above. There can thus be no mistake that the 1,000 cusecs referred to in the Project represents the quantity at the Reservoir if the whole had to be issued from the storage water.

2. In fact, this quantity is 200 cusecs in excess of that required for the power demands including the additional supply for the Kolar Gold Fields, as shown in the statement of calculations attached.

3. The provision made under the first stage of the Project represents more nearly the quantity of water necessary for generating the electric power now required including the demand of the Kolar Gold Fields; this is shown on page 32 of the Project where a provision of 750 cusecs only at the Reservoir instead of 1,000 has been made.

4. Thus, these quantities, *viz.*, 750 cusecs for the first stage and 1,000 cusecs for the second stage shown in the Project, give the measure of power water required at Kannambadi, including river flow, and not at Sivasamudram, as represented by Madras by mistake.

5. In fact, if 1,000 cusecs referred to in the Project were to be taken as at Sivasamudram, it would mean as much as 26,000 h.p., for which there is no possible demand either at present or in the future, the whole of the present and the contracted plant being capable of generating only about 17,500 h.p.

6. It is therefore obvious that the extreme demand on the Reservoir to be provided in the working tables, is 1,000 cusecs at Kannambadi less the natural flow in the river. Making an allowance of 25 per cent extra for the transmission factor between Sivasamudram and Kannambadi, the demand on the Reservoir would thus be (1,000—5/4 S), where S is the measured discharge at Sivasamudram. The expression 5/4 (1,000—S) used in the note presented on the 24th instant, is an error and is now corrected.

7. Fresh working tables with an explanatory note are therefore attached showing the distribution of water for the different stages of storage in supersession of the previous tables.

In this note, the points raised by the Madras Representative in his note of the 23rd instant have been answered and the tables are suitably modified.

KARPUR SHRINIVASRAV,
Mysore Representative.

2

Memorandum on the quantity of water required to generate power at Sivasamudram.

(Reference-page 36 of Mysore Project Report.)

	H. P.	Reference Para.
(1) Present maximum demand	12,000	1 (1)
(2) Additional power to be supplied to Messrs. John Taylor & Sons' Committee for which machinery is ordered	5,000	1 (3)
(3) Add for transmission losses on 2 at 8 per cent ...	400	1 (1) & 4
	17,400	

Water required at Sivasamudram = 485 cusecs for 13,000 h.p. Hence for 17,400 h.p.

13,000 h.p. : 485 cusecs : : 17,400 h.p. or

$\frac{17,400 \times 485}{13,000}$ = 649 cusecs at Sivasamudram.

Add 25 per cent for losses on the way ... 162 cusecs.

Total ... 811 cusecs, or in round figures, 800 cusecs if the whole flow had to be given from Kannambadi against 1,000 cusecs provided in the Project to meet remote contingencies.

Tentative rules for working the Kannambadi Reservoir for different conditions of storage.

A storage of about 4,000 million cubic feet above the irrigation sluice is proposed to be generally kept in the Reservoir at the beginning of the second half of June as a starting balance for the season.

With this assumption the normal storage required at the beginning of every month or the end of the preceding month has been calculated, working backwards from 15th June to the preceding September, as shown in column A of the statements attached. Thus, a storage of 30,597 million cubic feet would be required at the end of October for normal supply to irrigation and for power water.

Here the power water has been calculated on the basis of the worst year for which there is record at Sivasamudram, namely, 1906, as the total flow during the months March to May of this year at Kannambadi was nearly the same as in the corresponding period of 1899 as calculated by Madras. Thus, the discharge at Sivasamudram in the year 1899 would have very nearly coincided with that of the year 1906. So, the power water to be issued from the Reservoir would represent the maximum demand, being based on the minimum natural flow.

2. When the storage falls short of the normal supply of 30,597 million cubic feet noted above, the manner in which distribution is proposed may be shown for the several stages of storage differing by about 2,000 million cubic feet as in cases B to G of the statements attached, those under case A representing the normal figures.

Case.	Storage	At the end of October.
A	30,000	,,
B	28,000	,,
C	26,000	,,
D	24,000	,,
E	22,000	,,
F	20,000	,,
G	18,000	,,

Case A.

Storage at the end of October, 30,000 *million cubic feet.*—The supplies for irrigation and power will be as shown in columns 2 to 4 of the statements.

Case B.

Storage at the end of October, 28,000 *million cubic feet.*—The monsoon crop supply will be reduced by one-half in the months of December and first half of

January; the perennial crop supply remaining normal throughout. The actual storage required for this would be 28,191 million cubic feet.

Case C.

Storage at the end of October, 26,000 *million cubic feet.*—(*a*) The monsoon crop supply will be reduced by one-half in the months of November, December and first half of January.

(*b*) The perennial crop supply will be left undisturbed except in the two fortnights of January when only half supply will be given. The storage required with this arrangement would be 25,646 million cubic feet.

Case D.

Storage at the end of October, 24,000 *million cubic feet.*—(*a*) The monsoon crop supply will be reduced as in case C above.

(*b*) The perennial crop supply will be reduced by half in the months November to January, and by one-sixth from February onwards by reduction in the area of new perennial irrigation.

The quantity required would thus be 23,271 million cubic feet.

Case E.

Storage at the end of October, 22,000 *million cubic feet.*—(*a*) The monsoon crop supply will be reduced as in case C above.

(*b*) The perennial crop supply will be reduced by one-half in the months November to January, and by one-half from February onwards by reduction in the area of new perennial irrigation.

The quantity required in this case will be 21,416 million cubic feet.

Case F.

Storage at the end of October, 20,000 *million cubic feet.*—(*a*) Monsoon crop supply will be reduced by half in the months of November and December and fully cut off in the half month of January.

(*b*) The perennial crop supply will be reduced by one-half in the months of November to January; and from February onwards only one-third supply will be given for new perennial irrigation, thus stopping two-thirds of the area of new perennial irrigation.

The storage required to meet this programme would be 19,563 million cubic feet.

Case G.

Storage at the end of October, 18,000 *million cubic feet.*

(*a*) The monsoon crop supply will be reduced as in case F above.

(*b*) The perennial crop supply will be reduced by half from November to January; and from February, only one-fourth the supply will be given for new perennial irrigation by stopping three-fourths of that area.

The closing balance in this case would be less than 4,000 million cubic feet on 16th June and the issue to the succeeding monsoon crop will be delayed until the Reservoir receives replenishments from first freshes.

The storage required with this arrangement would be 17,302 million cubic feet.

3. The assumptions on which the above system of regulation is based may require modification in actual working. Although the figures in the statement give an idea of what is proposed to be done, they are not to be taken as finally binding. The draw-off figures for irrigation represent the average, while actuals may be more or less according to the requirements and do not include extraordinary draw-off when the river is in very high floods and the reservoir is surplussing.

4. The details of regulation as noted above have been shown in the form of tabular statements attached. In these, column 2 gives the monsoon crop draw-off at 103 million cubic feet per day up to January first half; column 3 gives the perennial crop draw-off at 44 million cubic feet per day throughout the year; column 4

gives the quantity required for power. This is calculated by subtracting from 1,000 cusecs, 5/4 of the flow recorded at Sivasamudram in 1906. The sum of the figures in columns 2 to 4 is given in column 5. On this the allowance for evaporation is calculated for each month or half-month on the basis of the balance at the beginning thereof as under:—

	INCHES.	
June	5	on water surface
July to February	4	do
March	5	do
April	7	do
May	8	do

In the application of the above rules to working tables, the following procedure may be observed:—

(*a*) The class of scale to be applied should be that indicated by the nearest equal figure at the end of October.

(*b*) If monsoon irrigation is started later than 15th June, extra issue will be made only for the number of days so delayed after 1st July.

(*c*) When reductions are made in the issue for new perennial crop area from February to June, supply will be given for such areas to enable monsoon crop being grown in them up to the limit of the average draw-off of 147 million cubic feet.

(*d*) The draw-off in the months of 16th June to 30th September will be generally 147 million cubic feet. But extra quantities will be drawn within permissible limits up to the maximum capacity of the canals, *viz.*, 3,000 cusecs. The quantity so drawn may average up to about 4,000 million cubic feet in any year.

Case A.—Balance at end of October—30,000 m.c.ft.

—	Monsoon crop	Perennial crop	Hot weather power	Total	Allowance for evaporation	Total storage required at end of month
1	2	3	4	5	6	7
September	...	...	...	33,307	...	35,493
October	3,193	1,364	...	28,750	339	30,597
November	3,090	1,320	...	24,340	301	25,886
December	3,193	1,364	...	19,783	274	21,055
January, first half	1,545	660	60	17,518	121	18,669
,, second half	...	704	31	16,783	110	17,824
February	...	1,232	719	14,832	214	15,659
March	...	1,364	1,694	11,774	244	12,357
April	...	1,320	2,132	8,322	278	8,627
May	...	1,364	1,499	5,459	251	5,513
June, first half	...	660	799	4,000	54	4,000

Normal table.

Case B.—Balance at end of October—28,000 m.c.ft.

—	Monsoon crop	Perennial crop	Hot weather crop	Total	Allowance for evaporation	Total storage required at end of month
1	2	3	4	5	6	7
September	3,193	...	...	30,937	...	33,077
October	3,193	1,364	...	26,380	329	28,191
November	3,090	1,320	...	21,970	290	23,491
December	*1,596*	1,364	...	19,010	255	20,276
January, first half	*772*	660	60	17,518	115	18,669
,, second half	...	704	31	16,783	110	17,824
February	...	1,232	719	14,832	214	15,659
March	...	1,364	1,694	11,774	244	12,357
April	...	1,320	2,132	8,322	278	8,627
May	...	1,364	1,499	5,459	251	5,513
June, first half	...	660	799	4,000	54	4,000

Monsoon crop—Half supply in December and January.
Perennial—Normal throughout.

5

Case C.—Balance at end of October—26,000 m.c.ft.

—	Monsoon crop	Perennial crop	Hot weather crop	Total	Allowance for evaporation	Total storage required at end of month
1	2	3	4	5	6	7
September	...	...	...	28,710	...	30,504
October	3,193	1,364	...	24,153	301	25,646
November	*1,545*	1,320	...	21,288	274	22,507
December	*1,596*	1,364	...	18,328	255	19,292
January, first half	*772*	*330*	60	17,166	113	18,017
,, second half	...	*352*	31	16,783	110	17,524
February	...	1,232	719	14,832	214	15,359
March	...	1,364	1,694	11,774	244	12,057
April	...	1,020	2,132	8,322	278	8,627
May	...	1,364	1,499	5,459	251	5,513
June, first half	...	660	799	4,000	54	4,000

Monsoon crop—half supply November, December and January, first half.
Perennial—half supply, January only.

Case D.—Balance at end of October—24,000 m.c.ft.

—	Monsoon crop	Perennial crop	Hot weather crop	Total	Allowance for evaporation	Total storage required at end of month
1	2	3	4	5	6	7
September	...	...	...	26,129	...	28,112
October	3,193	1,364	...	21,572	284	23,271
November	*1,545*	*660*	...	19,367	255	20,811
December	*1,596*	*682*	...	17,089	239	18,294
January, first half	*772*	*330*	60	15,927	110	17,022
,, second half	...	*352*	31	15,544	104	16,535
February	...	*1,027*	719	13,798	202	14,587
March	...	*1,137*	1,694	10,967	227	11,529
April	...	*850*	2,132	7,985	260	8,287
May	...	*1,137*	1,499	5,349	243	5,408
June, first half	...	*550*	799	4,000	54	4,000

Monsoon crop—half supply—November, December and January first half.
Perennial—half supply—November, December and January.
New crop area reduced—1/6th or 5/6th supply from February.

Case E.—Balance at end of October—22,000 m.c.ft.

—	Monsoon crop	Perennial crop	Hot weather crop	Total	Allowance for evaporation	Total storage required at end of month
1	2	3	4	5	6	7
September	...	...	...	24,398	...	26,247
October	3,193	1,364	...	19,841	271	21,116
November	*1,545*	*660*	...	17,636	239	18,972
December	*1,596*	*682*	...	15,358	220	16,471
January, first half	*772*	*330*	60	14,196	101	15,211
,, second half	...	*352*	31	13,813	94	14,734
February	...	*616*	719	12,478	181	13,218
March	...	*682*	1,691	10,102	213	10,629
April	...	*660*	2,132	7,310	246	7,591
May	...	*682*	1,499	5,129	229	5,181
June, first half	...	*330*	799	4,000	52	4,000

Monsoon crop—half supply—November, December and January first half.
Perennial crop—half supply—November, December and January; half supply to new perennial crop from February.

Case F.—Balance at end of October—20,000 m.c.ft.

—	Monsoon crop	Perennial crop	Hot weather crop	Total	Allowance for evaporation	Total storage required at end of month
1	2	3	4	5	6	7
September	...	...	...	22,636	...	24,375
October	3,193	1,364	...	18,079	255	19,563
November	*1,545*	*660*	...	15,874	225	17,133
December	*1,596*	*682*	...	13,596	202	14,653
January, first half	...	*330*	60	13,206	91	14,172
,, second half	...	*352*	31	12,823	88	13,701
February	...	*410*	719	11,694	170	12,402
March	...	*455*	1,694	9,545	199	10,054
April	...	*440*	2,132	6,973	239	7,243
May	...	*455*	1,499	5,019	220	5,069
June, first half	...	*220*	799	4,000	50	4,000

Monsoon crop—half supply—November, December and *nil* in January first half.
Perennial—half supply—November, December and January.
New perennial one-third supply—from February.

Case G.—Balance at end of October—18,000 m.c.ft.

—	Monsoon crop	Perennial crop	Hot weather crop	Total	Allowance for evaporation	Total storage required at end of month
1	2	3	4	5	6	7
September	...	...	...	20,591	...	22,108
October	3,193	1,364	...	16,034	249	17,302
November	*1,545*	*660*	...	13,829	209	14,888
December	*1,596*	*682*	...	11,551	181	12,429
January, first half	...	*330*	60	11,161	79	11,960
,, second half	...	*352*	31	10,778	76	11,501
February	...	*308*	719	9,751	149	10,325
March	...	*341*	1,694	7,716	176	8,114
April	...	*330*	2,132	5,254	206	5,446
May	...	*341*	1,499	3,414	166	3,440
June, first half	...	*115*	799	2,500	26	2,500

Monsoon crop—half supply—November, December and *nil* in January.
Perennial—half supply—November, December and January.
Do —quarter supply from February.

7

Exhibit My. 19-a.

I.

Tentative Rules for working the Kannambadi Reservoir for different conditions of storage.

A storage of about 4,000 million cubic feet, above the irrigation sluice, is proposed to be generally kept in the reservoir at the beginning of the second half of June as a starting balance for the season.

With this assumption, the normal storage required at the beginning of every month or the end of the preceding month has been calculated; working backwards from 15th June to the preceding 30th September as shown in column A (2 to 7) of the statement attached. Thus, a storage of 32,637 million cubic feet would be required at the end of October for normal supply to irrigation and for power water.

Here, the power water has been calculated on the basis of the worst year for which there is record at Sivasamudram, *i.e.*, for 1906. Also, the total flow during the months, March, April and May of this year, at Kannambadi, is nearly the same as in 1899 as calculated by Madras. So the power water to be issued from the reservoir would represent the maximum demand, being based on the minimum natural flow in the river.

2. When the storage falls short of the normal supply, the manner in which distribution is proposed may be shown for the several stages of storage differing by about 2,000 million cubic feet as in columns B to H of the statement ; those in column A representing the normal figures.

Case.		Storage.	At the end of
A	normal	32,000 m.c. ft.	October.
B	,,	30,000 ,,	,,
C	,,	28,000 ,,	,,
D	,,	26,000 ,,	,,
E	,,	24,000 ,,	,,
F	,,	22,000 ,,	,,
G	less than	25,000 ,,	September.
H	,,	23,000 ,,	,,

CASE A.

Storage at the end of October about 32,000 *million cubic feet.*—The supplies for irrigation and power will be as shown in columns 2 to 4. The actual storage required at the end of October will be 32,637 million cubic feet.

CASE B.

Storage at the end of October about 30,000 *million cubic feet.*— (*a*) The monsoon crop supply will be reduced by one-third in the months of November and December and by one-half in January by alternate distribution in the channels.

(*b*) The perennial crop supply will be unaffected. The actual storage required for this would be 30,479 million cubic feet.

CASE C.

Storage at the end of October about 28,000 *million cubic feet.*—(*a*) Monsoon crop supply will be reduced by one-half in the months, November to first half of January.

(*b*) The perennial crop supply will be left undisturbed, except in the two fortnights of January when half the normal supply will be given alternate distribution.

The total storage required for this arrangement is 28,875 million cubic feet.

... ...

CASE D.

Storage at the end of October about 26,000 *million cubic feet.*—(*a*) Monsoon crop supply will be reduced by one-half in the months, November to January first-half.

(*b*) The perennial crop supply will be reduced by one-third in the months of November and December ; by one-half in January ; and in addition, one-sixth reduction in supply to new perennial irrigation will be made from February onwards. This would mean that the area of new perennial irrigation would be reduced by

one-sixth. The storage required in this case is 26,917 million cubic feet at the end of October.

CASE E.

Storage at the end of October about 24,000 *million cubic feet.*—(*a*) Monsoon crop supply same as in case C above.

(*b*) Perennial crop supply same as in case D till the end of January; in addition one-half reduction in the supply to new perennial crop from February onwards. This would mean that the area of new perennial irrigation would be reduced by one-half. The storage required for the above arrangement is 24,854 million cubic feet.

CASE F.

Storage at the end of October 22,000 *million cubic feet.*—(*a*) Monsoon crop supply, same as in case C above.

(*b*) Perennial crop supply, one-half reduction in the months of November to January and two-thirds reduction from February onwards, thus stopping two-thirds of the new perennial irrigation. The total storage thus required at the end of October is 22,810 million cubic feet.

CASE G.

Storage less than 25,000 *at the end of September.*—(*a*) Half supply to monsoon crop from October to January first-half.

(*b*) The perennial crop supply will be reduced as in case F above, up to end of January; from February onwards, three-fourths reduction will be made, so that only one-fourth of the normal area would be cultivated.

CASE H.

Storage less than 23,000 *million cubic feet at the end of September.*—(*a*) Monsoon crop supply will be reduced to half from October to December and will be fully cut off in the first-half of January.

(*b*) Perennial crop supply same as in case G above.

The closing balances on the 15th June in cases F, G and H are less than 4,000 million cubic feet. The supply to irrigation in the respective succeeding years will be given a few days later after the reservoir receives proper supply from the first freshes.

3. The assumptions on which the above system of regulation is based may require modification in actual working. Although the figures in the statement give an idea of what is proposed to be done, they are not to be taken as finally binding. The draw-off figures for irrigation represent the averages, while actuals may be more or less according to the requirements and do not include extraordinary draw-off when the river is in very high floods and the reservoir is surplussing.

4. The details of regulation as noted above have been shown in the form of tabular statements attached. In these, column 2 gives the monsoon crop draw-off at 103 million cubic feet per day up to January first-half. Column 3 gives the perennial crop draw-off at 44 million cubic feet per day throughout the year, column 4 gives the quantity required for power. This is calculated by subtracting from 1,000 cusecs the flow recorded at Sivasamudram in 1906 and multiplying the difference by 5/4ths. The sum of the figures in columns 2 to 4 is given in column 5. On this the allowance for the evaporation is calculated for each month or half month on the basis of the balance of the beginning thereof as under :—

	INCHES.		INCHES.
June	... 5	April	... 7
July to February ...	... 4	May	... 8
March	... 5		

In the application of the above rules to working tables, the following procedure may be observed :—

(*a*) The class of scale to be applied should be that indicated by the nearest equal figure at the end of October.

(*b*) If monsoon irrigation is started later than 15th June, extra issue will be made only for the number of days so delayed after 1st July.

(*c*) When reductions are made in the issue for new perennial crop area from February to June, supply will be given for such areas to enable monsoon crop being grown in them up to the limit of the average draw-off of 147 million cubic feet.

(*d*) The draw-off in the months of 16th June to 30th September will be generally 147 million cubic feet. But extra quantities will be drawn within permissible limits up to the maximum capacity of the canals, *viz.*, 3,000 cusecs. The quantity so drawn may average up to about 4,000 million cubic feet in any year.

Case A.—32,000 million cubic feet at the end of October.

—	Draw-off for monsoon crop	Draw-off for perennial crop	Draw-off for power	Total	Evaporation	Total at the end of each month or fortnight
1	2	3	4	5	6	7
September	...	...	...	34,779	...	...
October	3,193	1,364	...	30,222	382	32,637
November	3,090	1,320	...	25,812	351	27,876
December	2,129	1,364	...	22,319	319	24,064
January First half	772	660	506	20,381	141	21,985
January Second half... ...	...	704	80	19,597	144	21,057
February	...	1,232	1,263	17,102	280	18,282
March	...	1,364	2,383	13,355	325	14,210
April	...	1,320	2,786	9,249	390	9,714
May	...	1,364	2,103	5,782	372	5,875
June, First half	...	660	1,122	4,000	93	4,000

Case B.—30,000 million cubic feet at the end of October.

—	Draw-off for monsoon crop	Draw-off for perennial crop	Draw-off for power	Total	Evaporation	Total at the end of each month or fortnight
1	2	3	4	5	6	7
September	...	...	...	32,652	...	35,401
October	3,193	1,364	...	28,095	355	30,479
November	2,060	1,320	...	24,715	339	26,760
December	1,418	1,364	...	21,933	310	23,668
January First half	386	660	506	20,381	141	21,975
January Second half... ...	...	704	80	19,597	144	21,047
February	...	1,232	1,263	17,102	278	18,274
March	...	1,364	2,383	13,355	313	14,214
April	...	1,320	2,786	9,219	405	9,703
May	...	1,364	2,103	5,782	362	5,874
June, First half	...	660	1,122	4,000	92	4,000

Case C.—28,000 million cubic feet at the end of October.

—	Draw-off for monsoon crop	Draw-off for perennial crop	Draw-off for power	Total	Evaporation	Total at the end of each fortnight
1	2	3	4	5	6.	7
September	...	...	...	31,102	...	33,789
October	3,193	1,364	...	26,545	357	28,875
November	1,545	1,320	...	23,680	324	25,686
December	1,065	1,364	...	21,251	301	22,956
January First half	386	330	506	20,129	138	21,596
January Second half... ...	...	352	80	19,597	133	21,031
February	...	1,232	1,263	17,102	283	18,253
March	...	1,364	2,383	13,355	316	14,190
April	...	1,320	2,786	9,249	400	9,684
May	...	1,364	2,103	5,782	344	5,873
June, First half	...	660	1,122	4,000	91	4,000

Case D.—26,000 million cubic feet at the end of October.

—	Draw-off for monsoon crop	Draw-off for perennial crop	Draw-off for power	Total	Evaporation	Total at the end of each month or fortnight
1	2	3	4	5	6	7
September	...	...	...	29,201	...	31,815
October	3,193	1,364	...	24,644	341	26,917
November	1,545	880	...	22,219	312	24,180
December	1,065	909	...	20,245	282	21,924
January { First half	386	330	506	19,023	133	20,569
January { Second half	...	352	80	18,591	139	19,998
February	...	1,027	1,263	16,301	266	17,442
March	...	1,137	2,383	12,781	307	13,615
April	...	1,083	2,786	8,912	387	9,359
May	...	1,137	2,103	5,672	356	5,763
June, First half	...	550	1,122	4,000	91	4,000

Case E.—24,000 million cubic feet at the end of October.

—	Draw-off for monsoon crop	Draw-off for perennial crop	Draw-off for power	Total	Evaporation	Total at the end of each month or fortnight
1	2	3	4	5	6	7
September	...	...	...	27,237	...	29,737
October	3,193	1,364	...	22,680	326	24,854
November	1,545	880	...	20,255	297	22,132
December	1,065	909	...	18,281	276	19,882
January { First half	386	330	506	17,059	130	18,530
January { Second half	...	352	80	16,627	129	17,969
February	...	616	1,263	14,748	252	15,838
March	...	682	2,383	11,683	291	12,482
April	...	660	2,786	8,237	369	8,667
May	...	682	2,103	5,452	341	5,541
June, First half	...	330	1,122	4,000	89	4,000

Case F.—22,000 million cubic feet at the end of October.

—	Draw-off for monsoon crop	Draw-off for perennial crop	Draw-off for power	Total	Evaporation	Total at the end of each month or fortnight
1	2	3	4	5	6	7
September	...	...	...	25,298	...	27,671
October	3,193	1,364	...	20,741	304	22,810
November	1,545	660	...	18,536	285	20,320
December	1,065	682	...	16,789	264	18,309
January { First half	386	330	506	15,567	123	16,964
January { Second half	...	352	80	15,135	123	16,409
February	...	410	1,263	13,462	238	14,498
March	...	454	2,383	10,625	276	11,385
April	...	440	2,786	7,399	354	7,805
May	...	454	2,103	4,842	325	4,923
June, First half	...	220	1,122	3,580	81	3,500

Case G.—Less than 25,000 million cubic feet at the end of September.

—	Draw-off for monsoon crop	Draw-off for perennial crop	Draw-off for power	Total	Evaporation	Total at the end of each month or fortnight
1	2	3	4	5	6	7
September	3,090	1,320	...	23,207	333	25,483
October	1,596	1,364	...	20,247	298	22,225
November	1,545	660	...	18,042	261	19,759
December	1,064	682	...	10,296	248	17,765
January { First half	386	330	506	15,074	119	16,424
January { Second half	...	352	80	14,642	122	15,870
February	...	308	1,263	13,071	235	14,064
March	...	341	2,383	10,347	246	11,094
April	...	330	2,786	7,231	345	7,633
May	...	341	2,103	4,787	319	4,870
June, First half	...	165	1,122	3,500	83	3,500

Case H.—Less than 23,000 million cubic feet at the end of September.

—	Draw-off for monsoon crop	Draw-off for perennial crop	Draw-off for power	Total	Evaporation	Total at the end of each month or fortnight
1	2	3	4	5	6	7
September	3,090	1,320	...	20,111	309	22,262
October	1,545	1,364	..	17,202	276	19,077
November	1,064	660	...	15,478	255	17,098
December	386	682	...	14,410	239	15,791
January { First half	...	330	506	13,574	111	14,844
January { Second half	...	352	80	13,142	114	14,298
February	...	308	1,263	11,571	224	12,503
March	...	341	2,383	8,847	254	9,525
April	...	330	2,786	5,731	321	6,088
May	...	341	2,103	3,287	286	3,358
June, First half	...	165	1,122	2,000	81	2,000

II.

Statement of daily draw-off for monsoon and perennial irrigation to be applied for the working tables.

Case	A		B		C		D		E		F		G		H	
Months	Monsoon	Perennial	Monsoon	Perennial	Monsoon	Perennial	Monsoon	Perennial	Monsoon	Perennial	Monsoon	Perennial	Monsoon	Perennial	Monsoon	Perennial
October	103	44	103	44	103	44	103	44	103	44	103	44	52	44	52	44
November	103	44	69	44	52	44	52	29	52	29	52	22	52	22	52	22
December	69	44	46	44	34	44	34	29	34	29	34	22	34	22	34	22
January { First half	52	44	26	44	26	22	26	22	26	22	26	22	26	22	...	22
January { Second half	...	44	...	44	...	22	...	22	...	22	...	22	...	22	...	22
February and beyond	...	44	...	44	...	11	...	37	...	22	...	15	...	11	...	11

Case	Storage		At the end of October	Case		Storage		At the end of October
A	32,000	m.c.ft.	,,	E		24,000	m.c.ft.	,,
B	30,000	,,	,,	F		22,000	,,	,,
C	28,000	,,	,,	G	Less than	25,000	,,	September
D	26,000	,,	,,	H	,,	23,000	,,	,,

Exhibit My. 20.

ENQUIRY INTO THE QUESTION OF STORAGE OF THE CAUVERY WATERS WITHIN MYSORE TERRITORY.

HOT WEATHER SUPPLY.

The Arbitrator's award under the term of reference, 2 (*b*), refers only to the irrigation season, June to January. The finding recorded regarding the hot weather supply is based on the assumption that the demand for power is both constant and certain and that its extent is such as to require a flow of 1,000 cusecs. No finding has been recorded regarding the extent of the prescriptive right of Madras to the flow required for their hot weather irrigation, under the Agreement of 1892, as asked for by both the parties. This note is accordingly presented for the consideration of the Arbitration Committee.

2. The representative of the Mysore Government brought to the notice of the Assessor certain facts on the 26th February 1914 in My. 19, with the object of showing what quantity of water should be provided for power supply in the working tables, the correct quantity according to the provision made in the Mysore project being less than 900 cusecs at Sivasamudram allowed in the finding. The Assessor has recorded that the matter requires a decision from the Arbitrator.

3. It may be stated at the outset that there would be no objection to a re-consideration of the question even under the strict terms of the law of arbitration. There are, doubtless, decisions to the effect that once an Arbitrator delivers an award he has no power to review it, as his jurisdiction over the matter in dispute must be deemed to have come to an end, with the pronouncement of such award. But, in this case, no *award* has yet been pronounced or delivered by the Arbitrator in regard to the hot weather supply, though a *finding* has been recorded.

4. It may be noted that this finding has been recorded not under issue 2 (*a*)* but under issue 2 (*b*).† The former, read apart from the latter, is wide enough to include the item of hot weather supply as well, on the basis of prescription. But when issue 2 (*a*) is read with issue 2 (*b*), as it should be read in consequence of the words "these rights" occurring in issue 2 (*b*), the hot weather supply will appear to lie *outside* the terms of reference as now framed. For, these terms are restricted to only the prescriptive rights, that could be conserved by a "volume of water measured at the Upper Anicut;" whereas the prescriptive right for the hot weather supply *cannot* be measured at that place at all. Accordingly, Mysore suggest that an appropriate issue for the hot weather supply may now be raised, as such supply is quite distinct and separable from the monsoon supply (from June to January) for which alone the award has now been given. (Russel on Arbitration and Award, 9th Ed., pages 227 and 370.)

*2 (*a*) "What is the extent of the prescriptive rights of Madras as against Mysore under that interpretation."

†2 (*b*) "What volume of water measured at the Upper Anicut is necessary to conserve these rights unimpaired."

5. Two material considerations affecting the finding on the hot weather supply as to quantity and place were pointed out in My. 19. This was objected to by the Madras Representative on the ground that My. 19 introduced new matter. Whatever may be the value of such an objection strictly according to the rules of technical procedure applicable to a Court of Law, it has been understood that, in the present inquiry, a somewhat greater freedom is permissible regarding the presentation of all facts necessary for a full and proper understanding of the subject.

6. In this instance, however, the re-consideration asked for is not based on any new matter, but only on certain important facts and figures bearing on this subject and contained in the exhibits already presented. These are now briefly enumerated.

(*a*) The present maximum demand on the power plant at Sivasamudram is 12,000 H.P. requiring about 485 cusecs of water at Sivasamudram. (My. 5, page

36.) The gold mines have demanded only 5,000 H.P. extra and the first stage of the reservoir project has been undertaken to fully meet this extra demand. The mines have, however, the option to take this amount or anything less.

(*b*) Accordingly, the Mysore Government sanctioned extensions and improvements to the Cauvery Power Scheme at a cost of Rs. 8 lakhs to generate this additional power of 5,000 H.P., "required by the Mining Companies in the near future." (*Vide* Government Proceedings on page 61, My. 5.)

(*c*) The quantity of water required for the total amount of power in the first stage, was estimated at 750 cusecs at the Kannambadi Reservoir and shown in the table on page 32, My. 5, against 650 cusecs actually required at Sivasamudram as indicated in My. 19.

(*d*) In the *complete* scheme (second stage) the storage provided for power supply has been based on a discharge of 1,000 cusecs. (My. 5, page 31, note 2.)

(*e*) But it should be observed that *no provision has been made in the estimate for the complete scheme* for any more electrical plant than that provided for in the estimate for the first stage. (*Vide* pages 61 and 62; also pages 15 and 31, My. 5.)

(*f*) From all this it is clear that there is no present nor even a near prospective demand for more than the amount of power that can be generated by 750 cusecs. A provision of 1,000 cusecs was made in the complete scheme only to meet *remote* contingencies.

(*g*) In fact, the primary object of the second stage is not the generation of power supply (as in the first stage) but extension of irrigation in tracts where it is needed.

(*h*) As already stated, the extra demand from the Mining Companies is only for 5,000 H.P. in the immediate future and machinery has been ordered only for this extra power. When any further demand arises, Mysore could more economically generate such additional power, as might be required, by a subsidiary installation at a suitable place lower down the Cauvery river *by utilizing a second time the same flow of 650 cusecs noted above.* There would be therefore no occasion to scrap any machinery already erected or now under erection.

7. Madras doubtless claimed 900 cusecs as measured at Sivasamudram relying on the figure of 1,000 cusecs entered against the *complete* stage of the Reservoir, obviously without going into all these details clearly given in the project report itself (My. 5.)

Mysore did not *expressly* question this assumption of measurement at Sivasamudram, as their case was and is that no *award* should be given on the basis of power supply, which is obviously of a *transitory and shifting character* and which is not the correct criterion for an *award* under the Agreement of 1892 governing the present dispute. Having objected to the principle itself, Mysore did not at that stage consider it necessary to *specifically* refer to the exact quantity of flow necessary for the immediate requirement of power supply. In fact, it has been urged by both the parties from the very early stages of the enquiry, that the finding as regards the hot weather supply should be based on prescriptive right. Such a decision is now asked for.

8. In Ma. 12, paragraph 99, Madras stated "should Mysore after reasonable notice discontinue the supply of 900 cusecs," their (Madras) existing rights to the whole natural flow (up to the limit claimed by them) must be recognized as unimpaired. It is manifest from this that Madras were fully prepared for a reduction, or even a discontinuance of the power supply.

The supply of the flow from Power Works has been made such an inflexible rule as to lead to the expression of the opinion that by 20 years' user "the prescriptive right of Madras to the 900 cusecs continuous supply must be held to have matured under any fair and reasonable application of the terms of 1892 Agreement." (*Vide* paragraph 109 of the Assessor's Examination of Evidence.)

If the demand for power is wholly or partly withdrawn, it is not made clear whether Mysore has the option to correspondingly discontinue or reduce the supply of power water. The finding only states that "Mysore shall be bound subject of course, to exemption to liability for interruption beyond their control, to send down during the hot weather season a continuous supply of 900 cusecs to Madras."

The finding on this point thus goes very much farther than the position taken by Madras themselves, so far as the character of the supply is concerned.

It may be remembered that even the present supply of about 500 cusecs required for power is maintained by curtailing supplies to hot weather crops in Mysore, as expressed by the Assessor himself in paragraph 115 of his Examination of Evidence.

If the finding be interpreted as binding Mysore to pass down 900 cusecs at Sivasamudram whether actually required for power or not, it would impose an unduly heavy burden on Mysore; *vide* paragraph 116 of the Assessor's Examination of Evidence.

9. Under these circumstances, it is urged that the question of the hot weather supply may be further examined and dealt with somewhat on the following lines:—

(*a*) The prescriptive limits of flow to which Madras may be entitled for hot weather irrigation in their territory from February to May, may now be fixed.

(*b*) If the actual demand for power generation does not necessitate the passing down of 900 cusecs, the natural flow up to these prescriptive limits, will then be left undisturbed except to the extent of customary draw-off in Mysore.

(*c*) But, if such power flow be not less than 900 cusecs, Mysore should be entitled to impound the entire flow in the river without restriction, as already admitted by Madras.

10. For the purpose of working tables, however, the figure of 1,000 cusecs at Sivasamudram has been adopted as the basis agreeably to the ruling given by the Assessor. The discussion on the third term of reference can thus proceed without delay as the further consideration of the question of the hot weather supply is practically independent.

Exhibit Ma. 24.

Madras note on third issue as affected by finding on second issue.

THIRD ISSUE, 1st CLAUSE (a).

The systems which have been proposed for computation of the supplies to be passed at Kannambadi in order to protect Madras rights have already been dealt with and analysed in the arguments already presented, and the arguments now put forward are limited to those which are the direct result of the award given with regard to the second issue.

2. As regards the alternative offered Madras for selection under the above, the Government of Madras wish here to record that they elect the alternative involving passing to Madras all water up to a natural flow limit of 22,750 cusecs, measured at the Upper Anicut, between 1st June and 31st January inclusive.

The Government of Madras, however, wish to guard themselves against the assumption that they accept this limit as sufficient to secure their existing interests. They desire to state that they elect this alternative without prejudice to their right to lay their views on this subject before the Government of India.

3. As regards the supplies to be passed at Kannambadi, the systems of measurement proposed are—

(1) The Madras system proposes the simultaneous measurement of the inflow to the reservoir, and of the flow of the Kabbani, and that Mysore should be allowed to impound whenever this combined flow exceeds the "limit flow" at the Upper Anicut *plus* percentages to cover risk of loss in transmission.

(2) The Mysore system involves forecasting, from the quantity of measured inflow into the reservoir, what the flow at the Upper Anicut is likely to be, by means of proportion factors fixed for the south-west and north-east monsoons and impounding any available surplus over this, making allowance for loss in transmission.

Combined with this, is provision for passing compensation water from Mysore reservoir to make up for deficiencies in the supplies received by Madras on days when the proportion factor applied failed to give the supplies due.

(3) The third system has some of the characteristics of both the above, and is simpler and more easily applied than either.

This consists of fixing for the south-west and north-east monsoons the proportions which the measured daily inflow into the reservoir will bear to the probable corresponding flow at the Upper Anicut, and multiplying these proportions factors by the limit flow allowed to Madras. Mysore is under this system to be allowed to impound all water coming into the reservoir in excess of that due to the resulting figure.

This system is in many respects similar to the Madras system but is decidedly simpler of application. It is also in some respect similar to that of Mysore, and again is much simpler of application, and does not entail the provisions for measuring at the Upper Anicut and for compensation water to which the Madras Government take the greatest exception on grounds already detailed.

4. The examination of the third system leads to the recognition that while materially simpler in application than either of the other systems, subject to fixing of suitable proportions for south-west and north-east monsoons, it can be made to secure Madras interests.

5. As regards Madras interests the essential principle of the third system is that it allows to Madras a share of any yield of the catchment in excess of the limit.

This is most clearly demonstrated by the Assessor in his *Examination of Evidence* paragraphs 96 to 104, when dealing with the matter of floods. In this he recognised the justice of the importance attributed by Madras to the beneficial effects of occasional floods on the Madras irrigation, and proceeds to demonstrate how a certain proportion of all yield of the catchment above the Upper Anicut when in excess of "limit flow" will still be available for Madras. This is a very important consideration, and the passing on to Madras of some proportion of flow over the limit would possibly have the effect of giving in sufficient quantities those extra occasional supplies which have been in the past the real source of supply of the Lower Coleroon system, as well as of occasional help to the Cauvery Delta irrigation. The Assessor clearly shows in his tables (paragraph 102) that while under the system examined by him, which is the third system, the greatest part of the surplus water would be impoundable by Mysore still a small share of every flood would pass to Madras. This matter of getting *a little extra with all the frequency of natural flow is of the utmost importance to Coleroon irrigation*, to which no other supply whatever except water passing over the 150 yards calingulah within the limit gauge which is a supply subject to a maximum of 1,030 cusecs is allowed in the award on the second issue, and it is believed that the facts set out in the tables, paragraph 102 of the Assessor's Examination of Evidence, have materially influenced him in forming his opinion that no specific supply is required for Coleroon system.

6. This opinion receives confirmation in the summing up of the Assessor, paragraph 88, having reference to his expressed opinion that no specific supplies are required for the Coleroon under the new conditions resultant on the award of a limit gauge of 6½ feet, having shown that the irrigation did not suffer in the past under the rules of 1905 of Upper Anicut. He here says "there is nothing in evidence to show that the irrigation will suffer in any way *if the supplies to the Coleroon available in the past under the operation of the 1905 rules are secured in the future*" (the italics are ours).

He proceeds immediately after to show in paragraph 102 that Madras must continue to get a share of all floods above the limits of supplies though the amount of this share will vary with any variation of the porportions which may be ultimately determined.

These two together show that while the Assessor recognised that the amount of extra water to be passed on such occasions would be reduced, a certain material proportion of this extra water would always be passed on every day on which it was under the previous conditions of the rules of 1905 available.

7. The above view of this matter is most strongly supported by the Arbitrator's finding (page 17, lines 29 to 33) which runs "that standard being fixed it has still to be decided what surplus is available after Madras requirements have been met, what proportions of that surplus may reasonably be claimed by Mysore. . . ." It is clear that the impression in the minds of both the Assessor and the Arbitrator in making the award is that a system of measurement should be adopted which conforms in system, although not in actual quantities, with the conclusions defined in the Assessor's paragraph 102 and accompanying table.

8. Under the system contemplated in paragraph 102 of the Assessor's Examination of Evidence, while the supplies available to pass to the Coleroon extra to those passed under the 6½ feet limit award, will be much reduced in quantity, he shows that the number of occasions of passing those supplies and the dates of such occasions will not be altered as compared with what would occur under a continuance of the rules of 1905, and this is *a vitally important* consideration in estimating the effect of the award given under the second issue on the Coleroon system, and as stated above it has evidently been carefully considered by both Assessor and Arbitrator.

9. The Government of Madras put forward for adoption either the first system of measurement which was originally put forward by them coupled with a suitable percentage for loss in transmission or in alternative the third system with such proportion fixed as will secure to them the limit flow at the Upper Anicut to which they are entitled whenever available under conditions of natural flow.

Both the above systems provide for a proportion of all excess flow passing to Madras.

10. The computations made by the Assessor are admitted to correctly represent what would happen under the third system of regulation under the assumption that the proportions adopted for south-west and north-east monsoons correctly represented day by day the yield of the whole catchment. This, of course, is far from strictly correct, but is a reasonable assumption for the purpose of illustrating the general effect of the system.

The material difference between this system and the Mysore system under a similar assumption is that while the third system allows to Madras *on every day on which yield of the whole catchment exceeds the limit flow a certain proportion of the extra yield*, the Mysore system allows to Madras extra flow *only on those days when the run-off of the lower catchment alone gives a yield in excess of the limit flow*, 22,750 cusecs allowed to Madras.

In the case of both systems, the days when Mysore reservoir is surplussing are days on which a large proportion of any extra yield of the whole catchment would pass down to Madras.

This cause operates frequently in a year of abundant flow but seldom in a year of deficient natural flow.

It will be clear that there will be under the Mysore system many days on which Madras would not get a proportion of the extra yield of the catchment which would be passed to her under the system illustrated by the Assessor in paragraph 102 of his Examination of Evidence about which he says in paragraph 103 referring to Madras " She would still enjoy in addition increments over and above those necessary supplies on every day in the year in which she would have enjoyed them under the old conditions, *i.e.*, without the Kannambadi reservoir though in diminished quantities."

In the north-east monsoons the yield of the lower catchment is considerable and at this time the essential difference between the two systems is not calculated to greatly injure Madras, but in the south-west monsoon the adoption of Mysore system would seriously injure Madras under an award which gives no specific supply for the Lower Anicut system, to compensate for the occasions on which natural flow to that system will be withdrawn.

11. It is true as pointed out by the Assessor, paragraph 89, that by altering the Lower Anicut, supplies equal to those now passed on to the fields, can be obtained from smaller total quantities of water than are passed into the Coleroon under existing conditions, but this is only true so long as the occasions of passing supplies are not materially reduced in frequency or the intervals between such occurrences materially altered.

12. Madras therefore contend that either the first or third system of measurement should be adopted, as only one of these systems can, under the award, give any prospect of adequate protection of the Lower Coleroon system.

The material difference between the Mysore system leaving out the compensation clauses and the third system, has been stated above and it is submitted that the adoption of the Mysore system threatens the prospects and prosperity of the Lower Anicut system of irrigation. While this system is small as compared with the immense areas comprising Cauvery Delta system, it is quite large considered by itself, 112,000 acres, or compared with the area proposed to be irrigated by Mysore, 150,000 acres.

13. The system of measurement put forward by Madras is either--

(*a*) The first system (the Madras system) allowing for 25 per cent. in the south-west monsoon to cover possible losses in transmission. This percentage to be a tentative figure. This would allow Mysore to impound any excess over the combined measured inflow to the reservoir *plus* the flow of the Kabbini--

	Cusecs
June to September	28,300
October to January	22,750

Or in the alternative--

(*b*) The third system with proportions as a tentative figure—

South-west monsoon	0·650
North-east „	0·425

14. Madras have, as promised, examined the Mysore system by means of tables drawn up with proportion figures—

South-west monsoon	0·70	Table IX.
North-east „	0·45	
South-west „	0·60	„ XI.
North-east „	0·40	

The Government of Madras are satisfied for the reasons already given in their recorded evidence and arguments, and for the additional reasons now put forward based on the new matter embodied in the findings and award under the first two issues, that the adoption of the Mysore system cannot be compatible with the protection of the rights of Madras and object to the system on these grounds.

The remarks on the examination of the tables drawn up to show the working of this system in its effect on Madras are not to be construed as being any admission that the principles embodied in this system cannot, under the award given on the second issue, be other than disastrous to the Madras irrigation systems and especially to the Coleroon irrigation.

15. No tables have been drawn to show the working of the Madras system (first system) as the discharges at Sivasamudram are not sufficiently accurate to enable tables to be based on them.

The way in which the tentative 25 per cent. has been arrived at has been described in Ma. 10, paragraphs 48 to 56. The figures are unreliable and all that can be claimed for this is that the figures are the best available.

16. As regards the third system which is the only alternative system which can adequately protect Madras interests, tables have been drawn on this system with proportion figures.—

South-west monsoon	·650	Table X.
North-east „	·425	
South-west „	·60	„ XII.
North-east „	·40	

From these tables can be seen what deficiences below *natural flow* limited to 22,750 cusecs (6½ feet gauge) at the Upper Anicut would under these proportions have been suffered by Madras, had the proposed reservoir conditions existed from 1896 to 1908.

The fluctuating and varying conditions of natural flow involve fluctuating and varying proportions of flow and thus the results of applying proportions must vary. The Madras Government have a title to be protected under the operation of this or any other system in the most unfavourable years and therefore it is to the years in which losses are most serious that attention is specially to be directed.

17. The statement following abstracts results from the detailed tables. The Government of Madras claim that the losses realised with proportions {·650 / ·425} are the maximum which, under reasonable consideration of the immense interests, can be suitable as tentative figures. It is to be realised that a reduction of one per cent. water-supply on an area of over one million acres represents a very large reduction, although in the form of a percentage it appears small.

The award on the second issue has cut down Madras supplies far below what has ever been received in the past, and it is claimed that really efficient protection of these reduced supplies is absolutely necessary.

Statement showing percentages of total supplies lost by Madras under proportions examined.

Months	1896		1897		1898		1899		1900		1901		1902		1903		1904		1905		1906		1907		1908	
	·6 ·4	·65 ·425	·6 ·4	·65 ·425	·6 ·4	·65 ·425	·6 ·4	·65 ·425	·6 ·4	·65 ·425	·6 ·4	·65 ·425	.6 ·4	·65 ·425	·6 ·4	·65 ·425	·6 ·4	·65 ·425	·6 ·4	·65 ·425	·6 ·4	·65 ·425	·6 ·4	·65 ·425	·6 ·4	·65 ·425
June —																										
First half	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Second half	...	...	1·25	·99	...	...	1·0	·7½	2·3	1·96	...	...	1·6	·85	...	...	...	...	...	...	43·9	39·5	0·16	...	...	...
July—																										
First half	...	...	...	...	...	...	...	...	...	...	...	...	1·7	·55	...	...	...	...	0·9	0·55	...	...	...	...	1·88	1·31
Second half	...	..	·26	...	...	...	...	...	...	...	...	...	1·52	1·04	...	...	...	...	1·5	1·20	...	...	...	...	1·97	0·96
August—																										
First half	...	...	...	...	...	...	3·4	2·3	3·8	1·76	...	...	1·71	7·1	...	...	...	...	·80	·20	...	...	...	...	...	...
Second half	...	...	...	...	...	...	...	...	...	...	·8	·6	1·41	·73	...	...	...	...	·40	...	...	...	...	...	0·15	...
September —																										
First half	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3·3	2·17	·13	...	...	...	·10	...	·05	...	...	...
Second half	...	...	...	...	...	...	1·1	1·11	...	...	...	...	...	...	...	...	...	...	6·8	5·18	...	...	...	...	...	...
October —																										
First half	...	...	·02	...	...	...	...	...	...	...	1·06	·61	...	...	...	...	·14	·01	...	...	...	...	...	...	...	...
Second half	...	...	...	...	...	...	6·3	6·12	...	...	·13	...	...	...	...	...	...	...	5·1	4·6	...	...	...	...	...	...
November—																										
First half	...	...	...	...	...	...	...	...	...	...	...	...	·41	·25	0·4	...	...	...	...	...	...	...	2·08	1·47	...	...
Second half	...	...	1·68	1·26	...	...	...	...	...	...	...	...	1·57	1·18	...	...	...	...	...	...	...	...	...	...	...	...
December—																										
First half	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	·74	·59	...	...	...	...	...	...	...	...
Second half	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

18. It is represented that the figures in the above abstract show that the Madras suggestion for a suitable proportion, *viz.*—

South-west monsoon	...	...	...	...	·650
North-east „	...	...	...	...	·425

are the best which can be considered to protect to a reasonable extent the passing without interruption or diminution the natural limit flow to which under the second issue it is ruled that Madras is entitled whenever it occurs. It will be seen under these proportions, interference and reduction of flow occurs to some extent almost every year.

Excluding June 1906 as abnormal, the percentage losses suffered by such interference in the south-west monsoon vary from 5·17 in the half month's supply downwards. In the north-east monsoon the percentage in second half of October is 6·12 per cent. It is submitted that, as a tentative figure, ·65 and ·425 may be fixed as the proportions for south-west and north-east monsoons respectively. It is added in explanation that the Government of Madras propose so low a limit in view of the recognized advantage which this system confers of giving to Madras a proportion of each yield of the catchment over the limit flow.

19. As regards the Mysore system, the working of the tables are best seen from diagrams of flow drawn from the resulting figures.

The objections to the system have already been described in the Madras case and in the previous paragraphs of this note in so far as it treats of its bearing on subject matter of the award on the first two issues.

Examining the diagrams for the years 1898, 1902, 1904, 1905 and 1908 it will be seen that the natural incidence of flow within the 6½ feet limit is materially affected and the already fluctuating flow made materially more fluctuating.

This is the effect of the system of compensation water to which Madras have objected for already stated reasons which, it is agreed, are not to be restated in this note and to which reference is invited.

The Government of Madras consider that if, in opposition to their contentions, this system is adopted, such proportions should be adopted as will reduce the "compensation water", with the resulting interference with flow and necessary errors in computation, to a small total as regards both quantity and occasions on which passing becomes necessary. The proportions—

South-west monsoon	...	...	...	...	·70
North-east „	...	...	...	...	·45

applied to this system are put forward as the smallest which can be said to fulfill this condition.

20. As regards the system generally, as the award on the second issue has recognised and considered the necessity to Madras of what has been called by Mysore "useful surplus," and as the Government of Madras recognise that it is only the surplus over the 6½ feet limit given under the award that can, in a bad year, save them from very heavy losses, it can no longer be contended that surplus over the limit flow is not useful, for the "limit flow" apart from a proportion of surplus is certainly not sufficient to protect Madras.

21. Tables for thirteen years and diagrams for five years have also been drawn to illustrate the proportions—

South-west monsoon	...	...	...	...	·60
North-east „	...	...	...	...	·40

in accordance with the suggestions of the Assessor.

It will be seen that with these proportions the occasional losses of Madras are materially greater and the fluctuations of flow more marked than with the proportions proposed for tentative adoption.

It is submitted that the diagrams show material interference with natural flow and material increase in incidence of fluctuations even for the proportions suggested by Madras and that no lower proportions should be adopted.

W. M. Ellis, Col., R.E.,
Madras Representative.

18th March 1914.

Exhibit Ma. 24--(e).

Abstract Results—Table X. Proportion ·65 S.W. / ·425 N.E.

Year and half month	Half-monthly total of natural discharge, Agunda Cauvery, limited to 1,966 million cubic feet in any day	Half-monthly total of column 10 limited to 1,966 million cubic feet in any day	Half-monthly totals of the quantity by which Madras is deprived	Percentage of diminution, column 2 to column 4	
				Proportion ·60 ·40	Proportion ·65 ·425
1	2	3	4	5	6
1896-1897.					
June ... First half	4,250	4,250	...	...	...
June ... Second ,,	20,413	20,413	...	...	...
July ... First ,,	28,019	28,019	...	..	...
July ... Second ,,	31,114	31,114	...	...	·26
August ... First ,,	29,490	29,490	...	..	...
August ... Second ,,	31,456	31,456	...	...	...
September ... First ,,	26,381	26,381	...	..	...
September ... Second ,,	18,347	18,347	...	...	...
October ... First ,,	23,994	23,994	...	...	·02
October ... Second ,,	11,568	11,568	...	...	...
November ... First ,,	6,324	6,324	...	...	...
November ... Second ,,	18,321	18,089	232	1·26	1·68
December ... First ,,	16,321	16,321	...	...	...
December ... Second ,,	15,304	15,304	...	...	...
January ... First ,,	5,690	5,690	...	...	...
January ... Second ,,	4,394	4,394	...	...	...
1897-1898.					
June ... First half	5,662	5,662	...	...	...
June ... Second ,,	23,105	22,876	229	0·19	1·25
July ... First ,,	17,506	17,506	...	...	...
July ... Second ,,	30,192	30,192	...	...	...
August ... First ,,	29,490	29,490	...	...	...
August ... Second ,,	31,456	31,456	...	...	...
September ... First ,,	28,681	28,681	...	...	...
September ... Second ,,	25,124	25,124	...	...	...
October ... First ,,	28,476	28,476	...	...	...
October ... Second ,,	21,739	21,739	...	...	...
November ... First ,,	11,412	11,412	...	...	...
November ... Second ,,	6,724	6,724	...	...	...
December ... First ,,	5,724	5,724	...	...	...
December ... Second ,,	3,972	3,972	...	...	...
January ... First ,,	2,700	2,700	...	...	...
January ... Second ,,	2,206	2,206	...	...	...
1898-1899.					
June ... First half	1,030	1,030	...	...	...
June ... Second ,,	22,155	22,955	...	...	...
July ... First ,,	14,340	14,340	...	...	..
July ... Second ,,	19,152	19,152	...	...	...
August ... First ,,	28,321	27,663	658	2·30	3·19
August ... Second ,,	15,876	15,876	...	...	...
September ... First ,,	19,086	19,086	...	...	...
September ... Second ,,	27,175	26,873	302	1·11	1·4
October ... First ,,	29,490	29,490	...	...	...
October ... Second ,,	27,352	25,714	1,678	6·12	6·30
November ... First ,,	27,921	27,921	...	...	...
November ... Second ,,	23,467	33,467	...	...	...
December ... First ,,	17,924	17,924	...	...	...
December ... Second ,,	11,008	11,008	...	...	...
January ... First ,,	9,065	9,065	...	...	...
January ... Second ,,	5,486	5,486	...	...	...

Abstract Results—Table X—*contd.*

Proportion {·65 S.W. ·425 N.E.

Year and half month	Half-monthly total of natural discharge, Aganda Cauvery, limited to 1,966 million cubic feet in any day	Half-monthly total of column 10 limited to 1,966 million cubic feet in any day	Half-monthly totals of the quantity by which Madras is deprived	Percentage of diminution, column 2 to column 4	
				Proportion ·60 ·40	Proportion ·65 ·425
1	2	3	4	5	6
1899-1900.					
June ... First half	4,696	4,696	...	...	...
... Second ,,	19,248	19,106	142	0·71	1·00
July ... First ,,	26,612	26,612	...	...	...
... Second ,,	16,330	16,330	...	...	...
August ... First ,,	7,141	7,015	126	1·76	3·80
... Second ,,	10,588	10,588	...	...	...
September ... First ,,	18,511	18,511	...	...	...
... Second ,,	20,691	20,691	...	...	...
October ... First ,,	7,340	7,340	...	...	...
... Second ,,	10,315	10,315	...	...	...
November ... First ,,	5,830	5,830	...	...	...
... Second ,,	1,504	1,504	...	...	...
December ... First ,,	938	938	...	...	...
... Second ,,	482	482	...	...	...
January ... First ,,	782	782	...	...	...
... Second ,,	552	552	...	...	...
1900-1901.					
June ... First half	3,979	3,979	...	...	...
... Second ,,	19,061	18,687	374	1·96	2·30
July ... First ,,	29,490	29,490	...	...	...
... Second ,,	31,456	31,456	...	...	...
August ... First ,,	29,490	29,490	...	...	...
... Second ,,	30,185	30,005	180	0·60	0·80
September ... First ,,	25,867	25,867	...	...	...
... Second ,,	18,786	18,786	...	...	...
October ... First ,,	15,251	15,153	98	0·64	1·06
... Second ,,	19,265	19,265	...	...	0·13
November ... First ,,	7,954	7,954	...	...	...
... Second ,,	5,452	5,452	....	...	...
December ... First ,,	3,214	3,214	...	...	...
... Second ,,	4,116	4,116	...	...	...
January ... First ,,	2,930	2,930	...	...	...
... Second ,,	2,846	2,846	...	...	...
1901-1902.					
June ... First half	4,910	4,910	...	...	...
... Second ,,	19,381	19,381	...	...	...
July ... First ,,	21,864	21,864	..	...	...
... Second ,,	30,171	30,171	...	...	...
August ... First ,,	29,276	29,068	208	0·71	1·74
... Second ,,	27,920	27,715	205	0·73	1·41
September ... First ,,	13,292	13,292	...	...	...
... Second ,,	21,472	21,472	...	...	...
October ... First ,,	28,142	28,142	...	...	...
... Second ,,	21,435	21,435	...	...	...
November ... First ,,	23,184	23,127	57	0·25	0·41
... Second ,,	18,772	18,551	221	1·18	1·57
December ... First ,,	8,679	8,679	...	...	...
... Second ,,	6,064	6,064	...	...	...
January ... First ,,	6,832	6,832	...	...	...
... Second ,,	5,000	5,000	...	...	...

Abstract Results—Table X—*contd.* Proportion {·65 S.W. ·425 N.E.

Year and half month	Half-monthly total of natural discharge, Agunda Cauvery, limited to 1,966 million cubic feet in any day	Half-monthly total of column 10 limited to 1,966 million cubic feet in any day	Half-monthly totals of the quantity by which Madras is deprived	Percentage of diminution, column 2 to column 4	
				Proportion ·60 ·40	Proportion ·65 ·425
1	2	3	4	5	6
1902-1903.					
June ... First half	3,568	3,568	...	...	...
June ... Second ,,	8,544	8,471	73	0·85	1·66
July ... First ,,	12,130	12,064	66	0·55	1·70
July ... Second ,,	31,017	30,696	321	1·04	1·52
August ... First ,,	21,749	21,749	...	...	...
August ... Second ,,	10,876	10,876	...	...	...
September ... First ,,	23,688	23,173	515	2·17	3·30
September ... Second ,,	22,289	22,289	...	...	...
October ... First ,,	15,956	15,956	...	...	...
October ... Second ,,	23,367	23,367	...	...	...
November ... First ,,	23,353	23,353	...	...	0·40
November ... Second ,,	14,328	14,328	...	...	...
December ... First ,,	23,394	23,394	...	...	...
December ... Second ,,	18,463	18,463	...	...	...
January ... First ,,	6,550	6,550	...	...	...
January ... Second ,,	5,536	5,536	...	...	...
1903-1904.					
June ... First half	5,786	5,786	...	...	...
June ... Second ,,	9,558	9,558	...	...	...
July ... First ,,	7,502	7,502	...	...	...
July ... Second ,,	31,456	31,456	...	...	...
August ... First ,,	29,490	29,490	...	...	...
August ... Second ,,	30,577	30,577	...	...	...
September ... First ,,	27,994	27,994	...	...	0·18
September ... Second ,,	27,918	27,918	...	...	...
October ... First ,,	27,892	27,889	3	0·01	0·11
October ... Second ,,	29,962	29,962	...	...	...
November ... First ,,	24,228	24,228	...	...	...
November ... Second ,,	26,399	26,399	...	...	...
December ... First ,,	26,497	26,339	158	0·59	0·74
December ... Second ,,	11,192	11,192	...	...	...
January ... First ,,	10,308	10,308	...	...	...
January ... Second ,,	3,808	3,808	...	...	...
1904-1905.					
June ... First half	15,178	15,178	...	...	...
June ... Second ,,	28,274	28,274	...	...	...
July ... First ,,	29,490	29,490	...	...	...
July ... Second ,,	31,349	31,349	...	...	...
August ... First ,,	26,491	26,491	...	...	...
August ... Second ,,	21,212	21,212	...	...	...
September ... First ,,	5,940	5,940	...	...	...
September ... Second ,,	14,637	13,880	757	5·18	6·80
October ... First ,,	6,674	6,674	...	...	...
October ... Second ,,	14,102	13,453	649	4·60	5·10
November ... First ,,	5,002	5,002	...	...	...
November ... Second ,,	1,424	1,424	...	...	...
December ... First ,,	322	322	...	...	...
December ... Second ,,	282	282	...	...	...
January ... First ,,	240	240	...	...	...
January ... Second ,,	292	292	...	...	...

Abstract Results—Table X—*contd.* Proportion {·65 S.W. ·425 N.E.

Year and half month	Half-monthly total of natural discharge, Agunda Cauvery, limited to 1,966 million cubic feet in any day	Half-monthly total of column 10 limited to 1,966 million cubic feet in any day	Half-monthly totals of the quantity by which Madras is deprived	Percentage of diminution, column 2 to column 4	
				Proportion ·60 ·40	Proportion ·65 ·425
1	2	3	4	5	6
1905-1906.					
June ... First half	1,336	1,336	...	...	...
Second ,,	8,246	8,246	...	...	...
July ... First ,,	21,853	21,716	136	0·55	0·90
Second ,,	22,608	22,337	271	1·20	...
August ... First ,,	20,598	20,558	40	0·20	0·80
Second ,,	14,509	14,509	...	...	0·40
September ... First ,,	21,031	21,031	...	...	0·10
Second ,,	10,600	10,600	...	...	...
October ... First ,,	14,823	14,823	...	...	...
Second ,,	19,656	19,656	...	...	...
November ... First ,,	4,338	3,338	...	...	...
Second ,,	5,142	5,142	...	...	...
December ... First ,,	4,376	4,376	...	...	...
Second ,,	1,974	1,974	...	...	...
January ... First ,,	230	230	...	...	...
Second ,,	1,376	1,376	...	...	...
1906-1907.					
June ... First half	692	692	...	...	...
Second ,,	4,733	2,863	1,870	39·5	43·90
July ... First ,,	5,479	5,479	...	...	...
Second ,,	23,398	23,398	...	...	...
August ... First ,,	27,782	27,782	...	...	...
Second ,,	30,799	30,799	...	...	...
September ... First ,,	26,492	26,492	...	...	0·05
Second ,,	16,807	16,807	...	...	...
October ... First ,,	19,402	19,402	...	...	...
Second ,,	23,598	23,598	...	...	...
November ... First ,,	7,693	7,693	...	...	...
Second ,,	10,022	10,022	...	...	...
December ... First ,,	6,098	6,098	...	...	...
Second ,,	8,890	8,190	...	...	...
January ... First ,,	5,216	5,216	...	...	...
Second ,,	3,238	3,238	...	...	...
1907-1908.					
June ... First half	5,060	5,060	...	...	...
Second ,,	14,703	14,703	...	...	0·16
July ... First ,,	20,001	20,001	...	...	...
Second ,,	19,512	19,512	...	...	...
August ... First ,,	29,490	29,490	...	...	...
Second ,,	31,456	31,456	...	...	...
September ... First ,,	26,080	26,080	...	...	...
Second ,,	13,690	13,690	...	...	...
October ... First ,,	19,566	19,566	...	...	...
Second ,,	12,806	12,806	...	...	...
November ... First ,,	12,362	12,180	182	1·47	2·08
Second ,,	9,133	9,133	...	...	...
December ... First ,,	5,070	5,070	...	...	...
Second ,,	5,856	5,856	...	...	...
January ... First ,,	3,432	3,332	...	...	...
Second ,,	3,462	3,462	...	...	...

Abstract Results—Table X—*concld.*

Proportion {·65 S. W. / ·425 N.E.

Year and half month	Half-monthly total of natural discharge, Aganda Cauvery, limited to 1,966 million cubic feet in any day	Half-monthly total of column 10 limited to 1,966 million cubic feet in any day	Half-monthly totals of the quantity by which Madras is deprived	Percentage of diminution, column 2 to column 4	
				Proportion ·60 ·40	Proportion ·65 ·425
1	2	3	4	5	6
1908-1909.					
June ... First half	2,382	2,382	...	...	...
Second ,, ...	5,270	5,270	...	...	...
July ... First ,, ...	20,967	20,692	275	1·31	1·88
Second ,, ...	30,204	29,915	289	0·96	1·97
August ... First ,, ...	29,490	29,490	...	...	...
Second ,, ...	26,444	26,444	...	...	0·15
September ... First ,, ...	17,757	17,757	...	...	...
Second ,, ...	5,964	5,964	...	...	...
October ... First ,, ...	6,374	6,374	...	...	...
Second ,, ...	14,252	14,252	...	...	...
November ... First ,, ...	12,233	12,233	...	...	...
Second. ,,.	2,546	2,546	...	...	...
December ... First ,, ...	1,334	1,334	...	...	...
Second ,, ...	1,696	1,696	...	...	...
January ... First ,, ...	...	...	...	...	...
Second ,, ...	...	...	...	...	...

Exhibit Ma. 24-f.

Abstract Results—Table XII.

Proportion. {·6 ·4

Year and half month	Half-monthly total of natural discharge, Agunda Cauvery limited to 1,966 m. c. ft. in any day	Half-monthly total of column 10 limited to 1,966 m.c.ft. in any day	Half-monthly totals of the quantity by which Madras is deprived	Percentage of diminution, column 2 to column 4	
				Proportion ·60 ·40	Proportion ·60 ·125
1	2	3	4	5	6
1896-1897.					
June ... First half	4,250	4,250	...	...	...
" Second "	20,413	20,413	...	...	...
July ... First "	28,019	28,019	...	...	...
" Second "	31,114	31,031	83	·26	...
August ... First "	29,490	29,490	...	...	...
" Second "	31,456	31,456	...	...	...
September ... First "	26,381	26,381	...	...	...
" Second "	18,347	18,347	...	...	...
October ... First "	23,994	23,987	7	·02	...
" Second "	11,568	11,568	...	...	...
November ... First "	6,324	6,324	...	...	...
" Second "	18,321	18,013	308	1·68	1·26
December ... First "	16,321	16,321	...	...	...
" Second "	15,304	15,304	...	...	...
January ... First "	5,690	5,690	...	...	...
" Second "	4,394	4,394	...	...	...
1897-1898.					
June ... First half	5,662	5,662	...	...	...
" Second "	23,105	22,816	289	1·25	·99
July ... First "	17,506	17,506	...	...	...
" Second "	30,192	30,192	...	...	...
August ... First "	29,490	29,490	...	...	...
" Second "	31,456	31,456	...	...	...
September ... First "	28,681	28,681	...	...	...
" Second "	25,124	25,124	...	...	...
October ... First "	28,476	28,476	...	...	...
" Second "	21,739	21,739	...	...	...
November ... First "	11,412	11,412	...	...	...
" Second "	6,724	6,724	...	...	...
December ... First "	5,721	5,721	...	...	...
" Second "	3,972	3,972	...	...	...
January ... First "	2,700	2,700	...	...	...
" Second "	2,206	2,706	...	...	...
February ... First "	...	...	..	...	...
" Second "	...	...	...	...	...
March ... First "	...	...	...	...	...
" Second "	...	...	...	...	...
April ... First "	...	..	...	...	...
" Second "	...	..	...	...	...
May ... First "	...	...	...	...	...
" Second "	...	...	...	...	...
1898-1899.					
June ... First half	4,030	4,030	...	...	...
" Second "	22,955	22,955	...	...	...
July ... First "	14,310	14,310	...	...	...
" Second "	19,152	19,152	...	...	...
August ... First "	28,321	27,351	970	3·4	2·8
" Second "	15,876	15,876	...	...	...
September ... First "	19,086	19,086	...	...	...
" Second "	27,175	26,796	379	1·4	1·11
October ... First "	29,490	29,490	...	...	...
" Second "	27,392	25,676	1,716	6·3	6·12
November ... First "	27,921	27,921	...	...	...
" Second "	23,467	23,467	...	...	..
December ... First "	17,924	17,924	...	...	...
" Second "	11,008	11,008	...	...	...
January ... First "	9,065	9,065	...	...	...
" Second "	5,486	5,486	...	...	...

Abstract Results—Table XII—*contd.*

Proportion ·6 / ·4

Year and half month	Half-monthly total of natural discharge, Agunda Cauvery limited to 1,966 m.c.ft. in any day	Half-monthly total of column 10 limited to 1,966 m.c.ft. in any day	Half-monthly totals of the quantity by which Madras is deprived	Percentage of diminution, column 2 to column 4	
				Proportion ·60 ·40	Proportion ·65 ·425
1	2	3	4	5	6
1899-1900.					
June ... First half	4,696	4,696	...	...	...
June ... Second ,, ...	12,248	19,016	202	1·0	·74
July ... First ,, ...	26,612	26,612	...	...	...
July ... Second ,, ...	16,340	16,340	...	...	...
August ... First ,, ...	7,141	6,868	273	3·8	1·76
August ... Second ,, ...	10,588	10,588	...	...	...
September ... First ,, ...	18,511	18,511	...	...	...
September ... Second ,, ...	20,691	20,691	...	...	...
October ... First ,, ...	7,340	7,340	...	...	...
October ... Second ,, ...	10,315	10,315	...	...	...
November ... First ,, ...	5,830	5,830	...	...	...
November ... Second ,, ...	1,504	1,504	...	...	...
December ... First ,, ...	938	938	...	...	...
December ... Second ,, ...	482	482	...	...	...
January ... First ,, ...	782	782	...	...	...
January ... Second ,, ...	552	552	...	...	...
1900-1901.					
June ... First half	3,979	3,979	...	...	...
June ... Second ,, ...	19,061	18,627	434	2·3	1·96
July ... First ,, ...	29,490	29,490	...	...	...
July ... Second ,, ...	31,456	31,456	...	...	...
August ... First ,, ...	29,490	29,490	...	...	...
August ... Second ,, ...	30,185	29,942	243	·8	·6
September ... First ,, ...	25,867	25,867	...	...	...
September ... Second ,, ...	18,786	18,786	...	...	...
October ... First ,, ...	14,251	15,089	162	1·06	·64
October ... Second ,, ...	19,265	19,240	25	·13	...
November ... First ,, ...	7,954	7,954	...	...	...
November ... Second ,, ...	5,452	5,452	..	...	...
December ... First ,, ...	3,244	3,244	...	...	...
December ... Second ,, ...	4,116	4,116	..	...	...
January ... First ,, ...	2,990	2,990	...	...	...
January ... Second ,, ...	2,846	2,846	...	...	...
1901-1902.					
June ... First half	4,910	4,910	...	...	...
June ... Second ,, ...	19,381	19,381	...	...	...
July ... First ,, ...	21,864	21,864	...	...	...
July ... Second ,, ...	30,171	30,171	...	...	...
August ... First ,, ...	29,276	28,768	508	1·7	·71
August ... Second ,, ...	27,920	27,526	394	1·4	·73
September ... First ,, ...	13,292	13,292	...	...	...
September ... Second ,, ...	21,472	21,472	...	...	...
October ... First ,, ...	28,142	28,142	...	...	...
October ... Second ,, ...	21,435	21,435	...	...	...
November ... First ,, ...	23,184	23,089	95	9	·25
November ... Second ,, ...	18,772	18,477	295	1·6	1·18
December ... First ,, ...	8,679	8,679	...	...	...
December ... Second ,, ...	6,064	6,064	...	...	...
January ... First ,, ...	6,832	6,832	...	...	...
January ... Second ,, ...	5,000	5,000	...	...	...
February ... First ,, ...	...	...	...	...	...
February ... Second ,, ...	...	...	...	...	...
March ... First ,, ...	...	...	...	...	...
March ... Second ,, ...	...	...	...	...	...
April ... First ,, ...	...	...	...	...	...
April ... Second ,, ...	...	...	...	...	...
May ... First ,, ...	...	...	...	...	...
May ... Second ,, ...	...	...	..	...	...

Abstract Results—Table XII—*contd.* Proportion {·6 ·4

Year and half month	Half-monthly total of natural discharge. Agunda Cauvery limited to 1,966 m.c.ft. in any day	Half-monthly total of column 10 limited to 1,966 m.c.ft. in any day	Half-monthly totals of the quantity by which Madras is deprived	Percentage of diminution, column 2 to column 4	
				Proportion ·60 ·40	Proportion ·65 ·425
1	2	3	4	5	6
1902-1903.					
June ... First half	3,568	3,568	...	...	...
Second ,, ...	8,511	8,411	133	1·56	·85
July ... First ,, ...	12,130	11,919	211	1·7	·55
Second ,, ...	31,017	30,542	475	1·52	1·01
August ... First ,, ...	21,749	21,749	...	...	...
Second ,, ...	10,876	10,876	...	...	...
September ... First ,, ...	23,688	22,895	793	3·3	2·17
Second ,, ...	22,289	22,289	...	...	...
October ... First ,, ...	15,956	15,956	...	...	...
Second ,, ...	23,367	23,367	...	...	...
November ... First ,, ...	23,353	23,262	91	0·4	...
Second ,, ...	14,328	14,328	...	...	...
December ... First ,, ...	23,394	23,393	1	...	...
Second ,, ...	18,463	18,463	...	...	...
January ... First ,, ...	6,550	6,550	...	...	...
Second ,, ...	5,536	5,536	...	...	...
1903-1904.					
June ... First half	5,786	5,786	...	...	...
Second ,, ...	9,558	9,558	...	...	...
July ... First ,, ...	7,502	7,502	...	...	...
Second ,, ...	31,456	31,456	...	...	...
August ... First ,, ...	29,490	29,490	...	...	...
Second ,, ...	30,577	30,577	...	...	...
September ... First ,, ...	27,994	27,957	37	·13	...
Second ,, ...	27,918	27,918	...	...	...
October ... First ,, ...	27,892	27,851	41	·14	·01
Second ,, ...	29,962	29,962	...	...	...
November ... First ,, ...	24,228	24,228	...	...	...
Second ,, ...	26,399	26,399	...	...	...
December ... First ,, ...	26,497	26,301	196	·74	·59
Second ,, ...	11,492	11,492	...	...	...
January ... First ,, ...	10,308	10,308	...	...	...
Second ,, ...	3,808	3,808	...	...	...
1904-1905.					
June ... First half	15,178	15,178	...	...	...
Second ,, ...	28,274	28,271	...	...	...
July ... First ,, ...	29,490	29,490	...	...	...
Second ,, ...	31,349	31,349	...	...	...
August ... First ,, ...	26,491	26,491	...	...	...
Second ,, ...	21,212	21,212	...	...	...
September ... First ,, ...	5,940	5,940	...	...	...
Second ,, ...	14,637	13,649	988	6·8	5·18
October ... First ,, ...	6,674	6,674	...	...	...
Second ,, ...	14,102	13,377	725	5·1	4·6
November ... First ,, ...	5,002	5,002	...	...	...
Second ,, ...	1,424	1,424	...	...	...
December ... First ,, ...	322	322	...	...	...
Second ,, ...	282	282	...	...	...
January ... First ,, ...	240	240	...	...	...
Second ,, ...	292	292	...	...	...

Abstract Results—Table XII—*contd.* Proportion {·6 ·4

Year and half month	Half-monthly total of natural discharge, Agunda Cauvery limited to 1,966 m.c.ft. in any day	Half-monthly total of column 10 limited to 1,966 m.c.ft. in any day	Half-monthly totals of the quantity by which Madras is deprived	Percentage of diminution, column 2 to column 4	
				Proportion ·60 ·40	Proportion ·65 ·425
	2	3	4	5	6
1905-1906.					
June ... First half	4,336	4,336	...	...	...
Second ,,	8,246	8,246	...	...	...
July ... First ,,	21,853	21,639	214	·9	·55
Second ,,	22,608	22,260	348	1·5	1·2
August ... First ,,	20,598	20,437	161	·8	0·2
Second ,,	14,509	14,449	60	·4	...
September ... First ,,	21,031	21,009	22	·1	...
Second ,,	10,600	10,600	...	...	...
October ... First ,,	14,823	14,823	...	...	...
Second ,,	19,656	19,656	...	...	...
November ... First ,,	4,338	4,338	...	...	...
Second ,,	5,142	5,142	...	...	...
December ... First ,,	4,376	4,376	...	...	...
Second ,,	1,974	1,974	...	...	...
January ... First ,,	230	230	...	...	...
Second ,,	1,376	1,376	...	...	...
1906-1907.					
June ... First half	692	692	...	...	...
Second ,,	4,733	2,652	2,081	43·9	39·5
July ... First ,,	5,479	5,479	...	...	...
Second ,,	23,398	23,398	...	...	...
August ... First ,,	27,782	27,782	...	...	...
Second ,,	30,799	30,799	...	...	...
September ... First ,,	26,492	26,478	14	0·05	...
Second ,,	16,737	16,737	...	...	...
October ... First ,,	19,402	19,402	...	...	...
Second ,,	23,598	23,598	...	...	...
November ... First ,,	7,693	7,693	...	...	...
Second ,,	10,022	10,022	...	...	...
December ... First ,,	6,098	6,098	...	...	...
Second ,,	8,190	8,190	...	...	...
January ... First ,,	5,216	5,216	...	...	...
Second ,,	3,238	3,238	...	...	...
1907-1908.					
June ... First half	5,066	5,066	...	...	...
Second ,,	14,703	14,680	23	·16	...
July ... First ,,	20,001	20,001	...	...	...
Second ,,	19,512	19,512	...	...	...
August ... First ,,	29,190	29,190	...	...	...
Second ,,	31,456	31,456	...	...	...
September ... First ,,	26,080	26,080	...	...	...
Second ,,	13,690	13,690	...	...	...
October ... First ,,	19,666	19,666	...	...	...
Second ,,	12,806	12,806	...	...	...
November ... First ,,	12,362	12,104	258	2·08	1·47
Second ,,	9,133	9,133	...	...	...
December ... First ,,	5,070	5,070	...	...	...
Second ,,	2,856	5,856	...	...	...
January ... First ,,	3,332	3,332	...	...	...
Second ,,	3,462	3,462	...	...	...

Abstract Results—Table XII—*concld.*

Proportion {·6 ·4

Year and half month	Half-monthly total of natural discharge, Agunda Cauvery limited to 1,966 m.c.ft. in any day	Half monthly total of column 10 limited to 1,966 m.c.ft. in any day	Half-monthly totals of the quantity by which Madras is deprived	Percentage of diminution, column 2 to column 4	
				Proportion ·60 ·40	Proportion ·65 ·425
1	2	3	4	5	6
1908-1909.					
June ... First half	2,382	2,382	...	...	...
June ... Second ,, ...	5,270	5,270	...	...	...
July ... First ,, ...	20,967	20,574	293	1·88	1·31
July ... Second ,, ...	30,201	29,608	596	1·97	0·96
August ... First ,, ...	29,490	29,490	...	...	...
August ... Second ,, ...	26,441	26,401	40	·15	...
September ... First ,, ...	17,757	17,757	...	...	...
September ... Second ,, ...	5,964	5,964	...	...	...
October ... First ,, ...	6,374	6,374	...	...	...
October ... Second ,, ...	14,252	14,252	...	...	...
November ... First ,, ...	12,233	12,233	...	...	...
November ... Second ,, ...	2,546	2,546	...	...	...
December ... First ,, ...	1,334	1,334	...	...	...
December ... Second ,, ...	1,696	1,696	...	...	...
January ... First ,, ...	...	...	...	...	...

Exhibit My. 21.

A Note on the Working Tables based on the Mysore System of Measurement.

Madras have generally accepted the system of measurement proposed by Mysore. The principles upon which this method is based have also been admitted by them to be sound in paragraphs 55 and 65 (Ma. 22) which may be quoted here for ready reference —

"As regards the system now proposed by Mysore, that part of it which provides for applying a factor to the flow at Kannambadi with a view to forecasting the probable flow at the Upper Anicut is recognised by Madras as a reasonable proposal, and one which, while giving to Mysore great advantages as regards impounding, may, subject to fixing suitable factors, adequately protect Madras interests while leaving Madras and Mysore mutually free to develop irrigation resources by more economical distribution by storage, etc.

"The measurement at the Upper Anicut and passing compensation water, much of which must be surplussed to waste, is an integral part of the Mysore system, but it is by no means an essential part. A reasonable increase in the proportion of water to be passed to Madras would obviate the necessity for compensation water and render all measurement at the Upper Anicut or below Sivasamudram unnecessary."

2. It is the Mysore method alone that can give due facilities for impounding according to the terms of the Agreement of 1892 without infringing on the Madras rights. While generally agreeing on this point, Madras object to the system on the following grounds :—

(*a*) That the tables based upon it show *minus* discharges at the Cauvery Dam on some days thus indicating a shortage in the natural supply.

(*b*) That it necessitates the passing of compensation water which means that the Madras supplies are interfered with on some days.

(*c*) That some of the compensation water passes away as surplus, even when made good.

(*d*) That the system involves the measurement of flow at the Cauvery Dam which would interfere with the future developments of Madras irrigation.

3. These objections have already been answered in general terms, in the several sections of the Mysore case, by means of hypothetical tables for a few years. Now, we have the Kannambadi discharges for 13 years 1896 to 1908 duly approved by the Assessor and the corresponding Cauvery Dam discharges also. From these, continuous tables can be prepared and general effect on Madras supplies discussed.

4. For preparing these working tables according to the Mysore method, the proportion of flow at Kannambadi to that at Cauvery Dam has first to be fixed. From the rough calculation made by the Assessor in paragraph 37 of his examination of evidence, the flow at Kannambadi may be taken as 0·48 and 0·14 of that at Cauvery Dam in the south-west and north-east monsoons respectively.

5. From the discharges at Kannambadi as calculated by Madras according to the method approved by the Assessor and from the recorded discharges at the Cauvery Dam, the proportions for the two monsoons have been shown for each year from 1896 to 1908 in the accompanying statement (A). The proportion for south-west monsoon varies from ·39 to ·64 and that for the north-east from 0·13 to 0·40.

6. To arrive at a fair proportion for the south-west monsoon, the average of the three lowest season discharges at the Cauvery Dam may be taken. This gives the proportion of 1/2·06. But to make up for possible fluctuations and to err on the side favourable to Madras the higher proportion of 1/1·80 has been taken. During the north-east monsoon the proportion in 10 out of 12 cases is not more than 0·25 and hence this proportion (¼) has been taken for that season.

7. Tables have been worked out accordingly with the above proportions for 13 years from 1896-97 to 1908 (December and two abstract statements B and C have been prepared showing the more important results of the tables in a compact form. From the results shown in these statements the objections of Madras may be answered *seriatim*.

8. As regards *minus* flow figures, it can be seen from a glance at abstract B that such figures have practically disappeared (columns 23 and 25). There are in all, during the 13 years, only five days when at all *minus* figures occur.

9. Of these, the quantity on three days is not worth mentioning. The remaining two days occur in June 1906 under exceptional circumstances and cannot be said to disturb the irrigation conditions. The objection therefore regarding such *minus* flows can, on all fair and reasonable considerations, be dropped.

10. The next point to consider is regarding the necessity of passing down compensation water. It will be observed that in abstract B (with the proportion of $\frac{1}{1\cdot8}$) the quantity of compensation water (column 15) in each year is more or less insignificent as compared with the total resulting flow at the Cauvery Dam (column 13). In fact the percentage of this (column 16) over the total flow varies from 2·8 per cent. in the year 1908 to 0·20 per cent. in the year 1903-04 and the average percentage for all the 13 years is only 0·93. It may be noted that, in the worst year 1899, the compensation water becomes due only on three days in the whole of the impounding season and the total quantity is only 1,754 m. c. ft. This quantity is too small to affect the Madras irrigation in any way. It is true that, in other years, the quantity is somewhat greater, but the abundant resulting flow at the Cauvery Dam in those years is more than sufficient to make up for all such fluctuations, The question of compensation water is therefore not a serious objection against the Mysore method.

11. The Assessor has noted in paragraph 137 of his Examination of Evidence when comparing annual supplies and irrigated areas, that deficiencies in the supplies have coincided with increase of area, generally indicating that, within certain limits varying from 2 per cent. to 20 per cent., the deficiency in supplies have not actually affected Madras irrigation.

In the present instance, it will be found that deficiency caused by compensation water amounts to almost an insignificant *percentage* (0·95 per cent.) of the resulting flow at the Cauvery Dam and consequently it may be left out of consideration. Even then it is very probable that the whole of the compensation water thus left out of account may not be impounded by Mysore, for much of it might surplus over the waste weir and would be available for use by Madras. It should also be remembered that compensation water becomes due only for few days when generally the river is in floods. Such small deficiencies can therefore be immediately made up.

12. The next objection of Madras is about the portion of compensation water which, when made good, will surplus at the Cauvery Dam over and above the 6½ feet limit. Here too, it may be pointed out that the quantity is very small, being naturally smaller than the whole quantity of compensation water noted above. The total of such surplus varies from 0·10 per cent. in the year 1903-04 to 1·4 per cent. in the year 1902-03 and the average for thirteen years is only 0·31 per cent. This is quite insignificant; and considering that such surplus may at the option of Madras be utilised for irrigation, there would be no loss to Madras on this account.

13. As regards the difficulties involved in the correct computation of the compensation water, it may be stated that any possible errors that may arise in such computation on particular days, would not produce any material difference, as it has been shown that the total annual quantities of compensation water are in themselves too small to prejudicially affect Madras irrigation.

It should be remembered that the flood discharges at the Cauvery Dam have been admittedly underestimated and the Assessor has also confirmed this by careful examination. If the discharges had been correctly estimated, it is very probable that the tables would have shown much less compensation water. The quantity would then be doubly negligible.

14. If, however, Madras want to obviate the measurement at the Cauvery Dam for any other reasons, this can be done by omitting out of account the compensation water, as the quantity is really very small. If such omission be not.

acceptable an alternative may be considered. Madras have, in the extract quoted under paragraph 1 above, suggested that a reasonable increase in the proportion would obviate the necessity for compensation water. Accordingly, another set of tables have been prepared with a higher proportion 1/1·6 or 0·625 (for the south-west monsoon). It should be remembered that this proportion is slightly exceeded in only two out of the thirteen years under consideration and to apply such a high proportion for all years, good or bad alike, would manifestly be to the disadvantage of Mysore.

15. If the proportion of 1/1·6 be adopted instead of 1/1·8, the quantity of compensation water would be reduced. A comparative statement C showing the distribution, by months, of the compensation water in the two cases have been attached. The total number of days in the thirteen years has been reduced from 142 in the latter to 96 in the former case.

In the former case, the maximum percentage is 1·9 and the minimum, 0·12; while, in the latter case, it ranges from 2·8 to ·20 of the total resulting flow at the Cauvery Dam, the average being ·73 and 0·95 respectively. This shows clearly that the Cauvery Dam conditions have all been improved by taking the higher proportion.

16. On the other hand, by the adoption of this proportion (1/1·6) facilities for impounding in the Mysore reservoir would be reduced, while the resulting flow at the Cauvery Dam would be correspondingly increased. In fact from column 12 of statements C and E it will be seen that the shortage in supplies for irrigation under the Mysore Reservoir with the proportion 1/1·8 is 27,5 ,2 m.c.ft., and this has been increased to as much as 30,895 m.c.ft., or 12 per cent. extra with the higher proportion of 1/1·6 causing considerable loss to Mysore, which cannot be recouped, whereas the small deficit in compensation water to be left out of account by Madras is more than made up by the abundant surplus flow at the Cauvery dam. This is an advantage to Madras for which a return would be justly due to Mysore. Such a return can be secured by omitting out of account the small quantity of compensation water occurring in the case of the increased proportion 1/1·6.

17. Also, it is to be observed that the proposed neglecting of such compensation water and the consequent retention of it in the reservoir would tend to fill it, somewhat sooner than otherwise; and then all water beyond the quantity drawn off for irrigation must surplus into the river; thus more or less natural conditions would be restored at an earlier date than by taking account of compensation water and passing it down from day to day.

18. On all "fair and reasonable" considerations therefore there can be no objection to the mode of measurement proposed by Mysore with the modifications suggested, *viz.*, (1) the adoption of the proportion of 1/1·6 and (2) the omission of all account of compensation water. By this means the measurement at the Cauvery Dam can be avoided. Mysore are willing to accept such high proportions on the condition that free impounding as in column 2 (e) would be allowed. By such a give and take process, the problem of measurement can be easily solved.

19. A few remarks may be made on the mode of impounding by the method of proportionate limit at the Kannambadi reservoir. According to this method the quantity allowable for impounding is represented by the expression K-NL, where K is the discharge at Kannambadi, L the limit (of 6½ ft. flow) at Cauvery Dam, N the proportion which the season flow at Kannambadi bears to that at Cauvery Dam. To get a comparison of the quantities of storage obtained by this method, with those by the Mysore method, a set of tables has been worked out with the proportions of 1/1·6 and 1/3·33. The results have been abstracted into a statement F for ready comparison with the results obtained by the Mysore method with the same proportions.

20. The following salient points under the two systems of impounding may be observed from statement F:—

(*a*) The total quantity available for impounding in the 13 years considered is 532,441 m.c.ft. by the proportionate limit method against 563,044 m.c.ft., by the Mysore method (column 3).

(*b*) There will be 9 out of 13 years with less than normal supply by the proportionate method against only 5 years by the Mysore method.

(*c*) Again, in two out of these nine years there will be *minus* balances in the reservoir of 4,994 and 396 m.c.ft. on the 1st June 1900 and 1906, respectively, indicating that there will not be sufficient water for power supply in these years.

(*d*) Further, the proportionate method produces shortage on the normal supply of as much as 59,060 m.c.ft. making it impracticable to maintain the irrigation conditions even under the last case H in two out of these 9 years, whereas under the Mysore method the shortage will be only about half the above amount, *viz.*, 30,895 m.c.ft. and confined to 5 years. Even the effects of this shortage can be tided over by judicious regulation under different cases as shown in column 11.

21. All this shows clearly that with the same proportions the purely proportionate method imposes restrictions quite double in their intensity and makes the working of the reservoir extremely difficult.

22. In fact the problem as to what ratio under the proportionate method would give the same facilities for impounding as the proportion of 1/1·6 gives according to the Mysore method, has been worked out algebraically (*vide* Appendix V) and the results are worth noting—

(*a*) To get 1,000 m.c.ft. storage with one and the same discharge at Kannambadi, a much lower proportion of ·36 will have to be adopted in the case of the proportionate method; and to get 2,000 m.c.ft. storage, the proportion will have to be further reduced to as low as 0·113.

(*b*) On the other hand, if the same proportion be taken for both the methods, for a given discharge at Kannambadi of, say, 3,000 m.c.ft. per day, the Mysore method will give 3,000 m.c.ft. storage against only 1,781 m.c.ft. by the proportionate method; and for a discharge of 2,000 m.c.ft. at Kannambadi, the two methods give 1,708 m.c.ft. and 781 m.c.ft., respectively.

23. The above results clearly show that the proportionate limit method as exemplified by the working tables, imposes double hardship on Mysore. While such undue restrictions would be imposed on Mysore, the quantity of surplus at the Cauvery Dam becomes unnecessarily large, resulting in so much more wastage into the sea, as already explained in paragraph 101, My. 8, although the precise object of the Mysore reservoir is to utilise as much of this surplus as possible. Unless a very low proportionate limit is fixed (even lower than 0·48 and 0·14 referred to in paragraph 4 above), the proportionate limit method cannot be expected to give fair and reasonable facilities for impounding in Mysore according to the terms of the Agreement of 1892.

Under the circumstances, herein presented, it is clear that the adoption of the Mysore method alone can be expected to give satisfaction to both the parties as that is the only method by which Mysore would be enabled to get their due share of the Cauvery waters without infringing on the rights of Madras.

24. In conclusion, it is urged that one of the two alternatives as under may be finally adopted—

(i) Proportions of 1/1·8 and 1/4·0 for the two seasons may be fixed with due computation and adjustment of compensation water; or,

$\frac{1}{1\cdot8} = \cdot555$

$\frac{1}{4\cdot0} = \cdot25$

(ii) The higher proportions of 1/1·6 and 1/3·33 for the two seasons may be taken, free impounding being allowed in Mysore as per column 2 (*e*) of the working tables, the computation of compensation water being neglected on account of the more restricted storage conditions.

$\frac{1}{1\cdot6} = \cdot625.$

$\frac{1}{3\cdot33} = \cdot3.$

KARPUR SHRINIVASRAV,
Mysore Representative.

18*th March* 1914.

APPENDIX V.

The prescriptive right of Madras has now been settled as extending to a limit of flow of water connoted by 6½ feet on the Cauvery Dam. Any flow above this limit is evidently available for impounding in Mysore. The problem now is to devise a method by which as much of this surplus as can be obtained at the Kannambadi reservoir, should be made available for being impounded therein.

2. The principle of the Mysore method may be put in the form of an algebraic equation thus:—

(i) Let K = discharge at Kannambadi.

C = corresponding discharge at Cauvery Dam.

$\frac{C}{K} = 1{\cdot}6$ or $C = 1{\cdot}6\ K$.

t = percentage factor of transmission loss, *i.e.*, if 100 be the flow at Kannambadi, $100-t$ will reach Cauvery Dam.

Let $T = \frac{100}{100-t}$

L = Limit flow = 1,950 m.c.ft. per day.

Then the surplus at the Cauvery Dam on any day may be represented by the expression $(C-L) = 1{\cdot}6\ K - L$.

The value of this at Kannambadi will thus be $T\ (1{\cdot}6\ K-L)$.

Let $T\ (1{\cdot}6\ K-L) = Q$ .... (A)

(ii) The principle of the proportionate limit method may also be put in the form of an algebraic equation thus:—

Let N = ratio of K to C or $\frac{K}{C}$.

Then the quantity that may be impounded is $(K-NL) = Q^1$ .... (B)

3. Then, in order that the quantities Q and Q^1 may be equal, the value of N should be such as to satisfy the equations

$T\ (1{\cdot}6\ K-L) = Q = (K-NL)$.

Eliminate K between the equations thus:—

From the second equation $K = NL+Q$; substituting this in the first, we have

$$T\left\{1{\cdot}6\ (NL+Q)-L\right\} = Q.$$

Dividing both sides by T,

$$1{\cdot}6\ (NL+Q)-L = \frac{Q}{T}.$$

Transposing,

$$1{\cdot}6\ NL = \frac{Q}{T}+L-1{\cdot}6Q$$

$$\therefore N = \frac{Q}{1{\cdot}6\ TL}+\frac{1}{1{\cdot}6}-\frac{Q}{L}$$

$$\text{or } N = \frac{1}{1{\cdot}6}-\frac{Q}{L}\left\{1-\frac{1}{1{\cdot}6T}\right\}.$$

Substituting the value of L, *viz.*, 1,950,

$$N = \frac{1}{1{\cdot}6}-\frac{Q}{1{,}950}\left\{1-\frac{1}{1{\cdot}6T}\right\} \quad \ldots\ldots\ldots\ldots\ldots \quad (C)$$

If $t = 22\frac{1}{2}$,

$$T = \frac{100}{100-t} = \frac{100}{77\frac{1}{2}} = \frac{40}{31}$$

Substituting this value of T in equation (C),

$$N = {\cdot}625-\frac{Q}{1{,}950}\left\{1-\frac{1\times 31}{1{\cdot}6\times 40}\right\}$$

Let Q=1,000.

Then $N = \cdot 625 - \frac{1,000}{1,950}\left\{1 - \frac{31}{64}\right\}$

$= \cdot 625 - \cdot 26 = \cdot 365$

If Q=2,000

Then $N = \cdot 625 - \frac{2,000}{1,950}\left\{1 - \frac{31}{64}\right\}$

$= \cdot 625 - \cdot 52 = \cdot 115.$

The greater Q is, the less will be the value of N in order that Q and Q^1 may be equal.

4. Putting the whole thing in ordinary language, if the Mysore method of measurement with a proportion of 0·625 between Kannambadi and Cauvery Dam flow give a surplus of 1,000 as available for impounding at Kannambadi, then the proportional limit to be placed on the river flow at Kannambadi, according to the proportionate limit method in order to give the same surplus for impounding is 0·365 and if the Mysore method give 2,000 with the same proportion, a proportion of 0·115 will give the same storage in the case of the proportionate limit method.

5. If the proportion be the same in both the cases, the quantities available for impounding will be different.

Thus, the expressions giving the quantities permissible for impounding according to the Mysore method, and the proportionate method are respectively—

$T(1 \cdot 6K - L) = Q$

$(K - NL) = Q^1$

Let $N = \frac{5}{8}$ or $\frac{1}{1 \cdot 6}$

and K=3,000

L=1,950

$T = \frac{41}{30}$

$\frac{41}{30}Q = (1 \cdot 6 \times 3,000 - 1,950)$

$= \frac{41}{30}(4,800 - 1950) = \frac{41}{30} \times 2,850 = 3,895$ or 3,000 or the entire flow at Kannambadi .... (D)

$Q^1 = 3,000 - NL$

$= 3,000 - \frac{5}{8} \times 1,950 = 3,000 - 1,219 = 1781$ .... (E)

Let K=2,000.

$Q = \frac{41}{30}(1 \cdot 6 \times 2,000 - 1,950)$

$= \frac{41}{30}(3,200 - 1950)$

$= \frac{41}{30}(1250)$

$= 1,708$ .... (F)

$Q^1 = 2,000 - 1,219 = 781$ .... (G)

Exhibit My. 21-a.

Statement A.

Statement of proportion between Cauvery Dam flow and Kannambadi flow for the years 1896-97 to 1908-09.

		1896-97	1897-98	1898-99	1899-00	1900-01	1901-02	1902-03	1903-04	1904-05	1905-06	1906-07	1907-08	1908-09
1		2	3	4	5	6	7	8	9	10	11	12	13	14
South-west monsoon, June to September.	Cauvery Dam ...	571,766	495,407	(3) 217,384	(2) 176,001	578,549	283,121	230,559	379,259	300,931	(1) 175,339	258,856	357,013	262,487
	Kannambadi ...	286,352	212,447	105,937	76,541	228,883	148,541	148,643	180,694	164,637	93,874	136,768	227,433	161,302
	Proportion c/k ...	2·00	2·33	2·05	2 30	2·53	1·91	1·56	2·10	1·83	1·87	1·89	1·58	1·63
	Proportion k/c ...	0·50	0·42	0·48	0·43	0·39	0·52	0·64	0·47	0·54	0·53	0·52	0·63	0·61
North-east monsoon, October to January.	Cauvery Dam ...	111,107	134,635	243,978	(1) 27,743	(3) 71,214	167,683	181,970	322,305	(2) 28,338	66,005	117,235	82,245	57,888
	Kannambadi ...	18,003	17,715	43,147	4,877	25,728	43,261	42,059	63,351	12,582	16,164	21,108	20,660	...*
	Proportion c/k ...	6·17	7·60	5·65	5·69	2·73	3·88	4·33	5·09	2·03	4·09	5·56	3·99	...
	Proportion k/c ...	0·16	0·13	0·17	0·17	0·36	0·25	0·23	0·19	0·40	0·23	0·18	0·25	...

Remarks.—*Kannambadi discharges not fully calculated.

N.B... (1) Average of the seasons marked (1), (2) and (3) in the south-west monsoon is 2·06 $\left(\frac{c}{k}\right)$ or $\frac{k}{c}$ is 0·49,

(2) For the north-east monsoon in 10 out of 12 cases the proportion k/c is not more than 0·25,

Exhibit My. 21-b.

Statement B.

Losses in transit 40 per cent. in June.
Do. 22½ per cent. July to January.

Proportion of flow at the Cauvery Dam to flow at Kannambadi.
1·8 : 1 June to September ; 4 : 1 October to January.

Year	Total flow at Kannambadi in m. c. ft.	Opening balance on 16th June	Balance at the end of October	Case	Number of days of impounding	Quantity impoundable (June to January)	Quantity actually stored	Percentage on Kannambadi flow	Surplus at Kannambadi		Total flow at the Cauvery dam (June to January)	Resulting flow at Cauvery dam	Compensation water			Compensation surplussed			Surplus flow at Cauvery Dam if impounding is not made		Surplus flow at Cauvery Dam if impounding is done		*Minus* flow at the Cauvery Dam	
									Number of days	Total surplus			Number of days	Quantity	Percentage	Number of days	Quantity	Percentage	Quantity	Number of days	Quantity	Number of days	Number of days	Quantity
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1896-97 ...	304,028	4,000	32,617	A	73	265,815	50,660	16·6	65	211,019	681,696	651,572	8	3,183	·49	3	496	·07	392,815	86	389,584	86	...	...
1897-98 ...	230,162	8,305	34,682	A	61	165,103	48,319	21·0	40	114,474	632,853	598,937	5	2,082	·34	2	1,445	·24	362,469	91	317,854	93	...	...
1898-99 ...	148,984	9,540	35,001	A	59	80,507	52,557	35·3	22	23,488	459,541	423,629	8	3,425	·88	4	2,037	·48	159,322	78	121,086	75	...	...
1899-00 ...	81,418	19,658	22,387	G & F	21	37,355	27,496	33·7	7	7,303	202,485	181,133	3	1,751	·95	1	777	·42	52,664	30	35,158	30	1	443
1900-01 ...	266,367	5,344	29,508	B	69	190,702	46,256	19·7	38	137,893	651,281	617,099	14	4,607	·74	2	1,175	·19	401,547	76	368,107	74	...	...
1901-02 ...	191,672	4,739	36.603	A	83	129,708	57,888	30·2	49	67,704	449,684	405,791	20	2,964	·73	6	566	·14	165,738	82	122,500	75	...	...
1902-03 ...	190,202	13,055	31,846	A	50	130,126	52,188	27·4	25	56,462	411,205	370,760	15	5,579	1·5	7	3,868	1·4	138,796	68	101,378	60	...	...
1903-04 ...	250.143	2,182	36,442	A	89	177,393	42,682	17·06	65	133.024	698,096	665,012	11	1,423	·20	5	709	·10	371,423	110	338,492	108	...	...
1904-05 ...	180.977	26,739	25,066	D	54	108,589	20,490	11·3	32	80,485	326,709	299,671	9	5,900	1·9	2	590	·20	129,674	58	97,430	58	1	166
1905-06 ...	183,894	9,501	28.078	C	32	48,958	41,187	22·4	...	...	240,424	208,501	17	5,989	2.8	4	1,429	·68	63,260	38	32,351	27	...	...
1906-07 ...	161,451	3,109	35,067	A	47	102,391	50,748	31·4	22	44,729	376,843	337,513	5	4,176	1·28	1	689	·20	157,274	62	118,810	61	2	2,672
1907-08 ...	254,900	11,092	33,481	A	59	198.684	43,433	17·04	39	149,769	438,902	405,292	9	4,139	1·02	2	877	·21	208,629	64	176,595	57	1	80
1908 ...	169,022	9,791	26,141	D	48	121,992	35,929	21·2	23	76,611	308,536	280,691	18	7,523	2·8	5	2,427	·86	126,387	47	102,845	38	...	...
Total ...	2,613,220	...	...	...	...	...	569,833	21·8	...	...	...	54,48,607	142	52,744	·96	44	17,085	·31	2,729,998	...	2,325,190	...	5	...

A. My. 21

Exhibit My. 22-c.

MYSORE METHOD.

Statement C.

Proportion 1·8.

Year	Balance on 1st June	Quantity actually stored in the irrigation season up to January	Quantity stored from February to May	Total of columns 2, 3 and 4	Expenditure				Balance	Case	Shortage in irrigation supply	Surplus		Remarks
					Irrigation	Evaporation	Power	Total of columns 6, 7 and 8						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1896-97	4,000	50,580	896	55,476	35,623	4,120	6,593	46,336	9,140	A	.....	211,049		
1897-98	9,215	48,809	550	58,574	36,283	4,314	7,886	48,483	10.091	A	.....	114,474		
1898-99	10,091	52,557	2,770	65,578	36,283	4,486	8,425	49,194	16,384	A	.....	23,488		
1899-00	16,387	27,496	1,273	45,156	26,193	3,627	8,728	38,548	6,608	G & F	10,090	7,303		
1900-01	6,610	46,256	514	53,380	33,261	3,845	11,238	48,344	5,036	B	3,022	137,893		
1901-02	5.005	57,878	702	63,585	36,283	4,411	8,610	49,304	14,281	A	.....	67,701		
1902-03	14,281	52,188	2,976	69,448	36,283	4,819	5,817	46,919	22,529	A	.....	56,462		
1903-04	22,528	42,682	4,683	69,893	36,327	5,065	1,106	42,498	27,395	A	.....	133,024		
1904-05	27,396	20,190	2,282	50,168	30,820	4,130	5,685	40,635	9,533	D	5,463	80,485		
1905-06	9,501	41,187	27	50,718	32,491	3,772	9,371	45,634	5,084	C	3,792	.....		
1906-07	4,991	50,748	980	56,669	34,638	4,005	5,978	44,621	12,048	A	* 1,645	44,729		
1907-08	12,053	43,433	2,051	57,540	36,327	3,961	4,772	45,060	12,480	A	.....	149,769		
1908	12,470	35,929	...	48,399	25,329	2,211	646	28,186	20,213	D	3,530	76,611		* The shortage is due to starting the irrigation late in the year.
Total ...	...	570,233	19,647	...	436,141	52,766	81,855	573,762	...	...	27,512	1,172,991		

N.B.—(1) Normal irrigation requirement is 36,283.

(2) In 1908 irrigation requirement is 28,859 to end of December.

(3) In 1896 irrigation requirement is 35,623 excepting first half of June.

(4) The tables are worked from 16th June 1896 to end of December 1908.

(5) Figures in column 12 are obtained by deducting the figure in column 6 from the above figures for the respective years.

Exhibit My. 21-d.

Statement D.

Losses in transit 40 per cent. in June.
Do 22½ per cent. July to January.

Proportion of the flow at the Cauvery Dam to flow at Kannambadi—
1·6 : 1 June to September; 3⅓ : 1 October to January.

Year	Total flow at Kannambadi in m.c.ft.	Opening balance on 16th June	Balance at the end of October	Case	Number of days of impounding	Quantity impoundable (June to January)	Quantity actually stored	Percentage on Kannambadi flow	Surplus at Kannambadi		Total flow at the Cauvery dam (June to January)	Resulting flow at the Cauvery dam	Compensation water			Compensation surplussed			Surplus flow at Cauvery Dam if impounding is not made		Surplus flow at Cauvery Dam if impounding is done		*Minus* flow at the Cauvery Dam		Remarks
									Number of days	Quantity			Number of days	Quantity	Percentage	Number of days	Quantity	Percentage	Quantity	Number of days	Quantity	Number of days	Number of days	Quantity	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1896-97 ...	304,208	4.000	32,200	A	76	253,647	50,250	16·5	56	200,049	681,696	648,818	7	2,595	·39	3	624	·10	392,815	86	360,465	84	...	...	
1897-98 ...	230,162	8,812	34,682	A	66	161,771	49.004	21·3	33	111,590	628,853	594,143	1	706	·12	1	706	·12	357,393	95	326,439	95	...	...	
1898-99 ...	148,984	9.212	35,013	A	48	72,386	52,362	35·1	16	15,813	459.511	420.332	8	3,263	·77	4	1,586	·37	159,322	78	121,353	76	...	...	
1899-00 ...	81,418	19,017	21,803	G & F	18	32,729	27,046	33·2	6	4,331	202,485	182,581	3	910	·49	1	474	·26	52,664	30	33,116	30	1	156	
1900-01 ...	266,367	4,577	28,881	C	62	177,512	46.016	17·3	35	126,132	651,284	607,237	7	3,839	·62	1	1,093	·17	401,547	76	368,135	74	...	...	
1901-02 ...	191,672	3,841	36,604	A	69	110.456	56,825	29·6	36	49,753	449,684	404,833	14	2,997	·74	4	572	·14	165,738	83	120,555	73	...	...	
1902-03 ...	190.202	12,613	34,152	A	50	112,801	52,535	27·6	19	52,858	411,205	369,695	16	5,743	1·90	6	1,380	·46	148,796	68	118,575	60	...	...	
1903-04 ...	250,143	21,579	36,442	A	72	164,261	42,678	17·1	43	120,055	698,096	664,990	4	1,184	·19	2	183	·029	371,423	110	318,169	108	...	...	
1904-05 ...	180,977	22.634	24,921	E	45	97,265	20,420	11·3	29	76,844	326,709	312,187	7	4,462	1·48	2	267	·09	129,674	58	116,906	58	1	166	In Oct.
1905-06 ...	183,894	10,655	28,520	C	26	42,776	39,527	21·5	0	0	240,424	209,402	7	2,498	1·19	1	1,245	·56	63,260	38	34,023	33	...	.	
1906-07 ...	161,451	3.745	35,066	A	41	94,900	50,066	31·01	16	38,838	376,843	337,409	6	3,618	1·08	2	770	·23	157,274	62	116,146	61	2	2,672	In June.
1907-08 ...	254,900	12,816	32,207	A	56	191,604	43,177	16·9	36	141,497	438,902	404,305	7	3,046	·75	0	0	0	208,629	64	174,590	59	1	80	In Nov.
1908	169,022	10,487	24,862	E	45	113,180	36,138	21·4	22	72,782	308,536	279,888	9	3,385	1·32	6	1,598	·62	126,389	46	100,249	42	...	...	To end of Dec.
Total ...	2,613,400	...	...	...	...	...	566,044	21·6	...	1,013,542	5,878,578	5,770,517	96	38,246	·73	...	10,496	·201	...	...	...	...	...	...	

Exhibit My. 21-e.

MYSORE METHOD.

Statement E.

Proportion 1·6.

Year	Balance on 1st June	Quantity actually stored in the irrigation season up to January	Quantity stored from February to May	Total of columns 2, 3 and 4	Expenditure				Balance	Case	Shortage in irrigation supply	Surplus	Remarks
					Irrigation	Evaporation	Power	Total of columns 6, 7 and 8					
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1896—97	4,000	50,250	1,011	55,261	35,623	4,141	6,593	46,357	8,902	A	...	200,049	
1897—98	8,892	49,004	610	58,506	36,283	4,365	7,886	48,498	10,010	A	...	111,590	
1898—99	10,217	52,362	2,770	65,349	36,283	4,398	8,425	49,106	16,243	A	...	15,813	
1899—00	16,249	27,046	1,273	44,568	26,173	3,594	8,728	38,495	6,073	G & F	10,110	4,331	
1900—01	6,049	46,016	514	52,579	31,986	3,898	11,238	47,122	5,457	C	4,297	126,132	
1901—02	5,584	56,825	702	63,111	36,278	4,379	8,610	49,267	13,844	A	...	49,753	
1902—03	13,845	52,535	2,976	69,356	36,283	4,756	5,817	46,856	22,500	A	...	51,464	
1903—04	22,425	42,678	4,683	69,786	36,327	5,014	1,106	42,447	27,339	A	...	120,055	
1904—05	27,339	20,420	2,282	50,041	29,041	4,115	5,685	38,841	11,200	E	7,242	67,230	
1905—06	11,247	39,527	27	50,801	32,000	3,751	9,371	45,212	5,589	C	4,193	...	
1906—07	5,624	50,066	940	56,620	34,772	4,051	5,978	44,801	11,819	A	1,511	38,838	Late starting of mousoon crop irrigation.
1907—08	11,829	43,177	2,054	57,060	36,327	4,083	4,772	45,182	11,878	A	...	144,497	
1908	11,914	36,138	...	48,052	25,317	2,202	646	28,165	19,887	E	3,542	72,762	
Total ...	...	563,044	19,647	...	432,763	52,747	84,855	570,385	...	...	30,895	1,002,534	

Exhibit My. 21-f.

TABLES I* AND III.* **Statement F.** Proportion 1·6.

Year				Balance, 1st June	Quantity actually stored in the irrigation season up to January	Quantity stored from February to May	Total of columns 2, 3 and 4	Expenditure				Balance	Case	Shortage in irrigation supply	Surplus	Remarks
								Irrigation	Evaporation	Power	Total of columns 6, 7 and 8					
1				2	3	4	5	6	7	8	9	10	11	12	13	14
1896-97	Table	I	...	4,000	49,123	896	54,019	33,500	4,082	6,593	44,175	9,844	B	2,123	137.773	(1) The actual irrigation issue would only be 19,950 million cubic feet up to the date when the level falls to the sill of irrigation sluice.
	,,	III	...	4,000	50,250	1,011	55,261	35,623	4,141	6,593	46,357	8,902	A	...	200.049	
1897-98	,,	I	...	9,858	45,809	550	56,217	36,283	3,972	7,886	48,141	8,076	A	...	67.671	
	,,	III	...	8,892	49.004	610	58,506	36,283	4,365	7,886	48,498	10,010	A	...	111,590	
1898-99	,,	I	...	8.069	42.376	2,770	53,215	29,260	3.596	8.425	41,281	11,934	H & D	7,023	...	
	,,	III	...	10,207	52.362	2,770	65,349	36.283	4,398	8.425	49,106	16,243	A	...	15,813	
1899-00	,,	I	...	11.879	18,219	1,273	31.371	(1) 26,088	1,539	8,728	36.365	—1,991	H	...	...	(2) Zero has been taken as the starting balance.
	,,	III	...	16,249	27.046	1,273	44.568	26,173	3,591	8,728	38,495	6,073	G & F	10,110	4.331	
1900-01	,,	I	...	—4,992 0	48,552	504	49,056	30.331	3,511	10,084	43,956	5,100	C	5,952	74,670	
	,,	III	...	6,049	46.016	514	52.579	31,986	3,898	11,238	47,122	5,457	C	4,297	126.132	
1901-02	,,	I	...	5,098	54,345	702	60,145	36,283	4.155	8,610	49,018	11,097	A	...	11.580	This figure does not include 1,154 million cubic feet issue for power in June. The actual irrigation issue would be 23,142 million cubic feet as in (1). Zero has been taken as the starting balance for 22nd June instead of—2,391 million cubic feet. This figure does not include 1,785 million cubic feet issue for power in June.
	,,	III	...	5,584	56,825	702	63,111	36,278	4,379	8,610	49, 67	13,844	A	...	49,753	
1902-03	,,	I	...	11,101	55.181	2,976	69,258	36,283	4,676	5.817	46.776	22.482	A	...	25.496	
	,,	III	...	13.845	52,535	2,976	69.356	36,283	4,756	5,817	46,856	22.500	A	...	51.464	
1903-04	,,	I	...	22,412	42.379	4,683	69.831	36.327	5,047	1,106	42,480	27,351	A	...	70.249	
	,,	III	...	22,425	42,678	4.683	69,786	36.327	5,014	1,106	42,447	27,339	A	...	120.055	
1904-05	,,	I	...	27,380	21,575	2,282	51,237	30,841	4,141	5,685	40,667	10,570	D	5,442	43,319	
	,,	III	..	27,339	20,420	2,282	50.041	29,041	4,115	5,685	38,841	11.200	E	7,242	67,230	
1605-06	,,	I	...	10,557	26,084	27	36,668	25.323	2,370	9,371	37,064	—396	H	...	...	
	,,	III	...	11,247	39,527	27	50,801	32,090	3,751	9,371	45,212	5,589	C	4,193	..	
1906-07	,,	I	...	—306 0	47.580	930	48.510	32.890	3,735	4,193	40,818	7,692	B	3,393	14.166	
	,,	III	...	5,624	50,066	930	56,620	31,772	4,051	5,978	41,801	11,819	A	1,511	38,838	
1907-08	,,	I	...	7,679	45,944	2,054	55,677	34.160	3,955	4,772	42,887	12,790	B	2.123	92,754	
	,,	III	...	11.829	43,177	2,054	57,060	36.327	4,083	1,772	45,182	11,878	A	...	144.497	
1908	,,	I	...	12,799	34,914	...	47,713	25.329	2,169	646	28,144	19,569	E	3,530	42,250	
	,,	III	...	11,914	36,138	...	48,052	25,317	2,202	646	28,165	19.887	E	3,542	72,782	
Total	,,	I	...	...	532.441	..	...	...	...	...	...	...	...	59,060	...	
	,,	III	...	...	563,044	19,647	...	432,783	52,747	84,855	570,385	...	...	30,895	1,002,531	

N.B.—(1) Normal irrigation requirement is 36,283
(2) In 1908 irrigation requirement is 28,859 to the end of December.
(3) In 1896 irrigation requirement is 35,623 excepting first half of June.
(4) The tables are worked from 16th June 1896 to the end of December 1908.
(5) Figures in column 12 are obtained by deducting column 6 from these figures for the respective years.
* Table I denotes proportionate method and Table III Mysore method.

Exhibit My. 21-g.

Statement G.

STATEMENT showing the quantity of compensation water and the number of days on which it becomes due (from 1896-1908).

Months	1896-97				1897-98				1898-99				1899-00				1900-01				1901-02				1902-03			
Proportion	1·8 4·0		1·6 3·33		1·8 4·0		1·6 3·33		1·8 4·0		1·6 3·33		1·8 4·0		1·6 3·33		1·8 4·0		1·6 3·33		1·8 4·0		1·6 3·33		1·8 4·0		1·6 3·33	
	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
June ...	...	...	...	...	1	1,287	*1*	*706*	...	...	...	...	1	777	*1*	*474*	3	1,855	*2*	*1,682*	1	626	*1*	*591*	...	...	...	...
July ...	3	496	*2*	*44*	2	309	...	...	1	86	...	...	...	...	...	...	...	...	...	...	1	82	...	...	6	3,821	*5*	*2,989*
August ...	...	...	...	...	...	...	...	...	4	995	*4*	*1,699*	2	977	*2*	*436*	4	222	*2*	*143*	8	843	*7*	*817*	1	280	*1*	*32*
September ...	1	580	*1*	*580*	1	124	...	...	3	2,344	*3*	*1,313*	...	...	...	...	1	31	...	...	...	...	...	...	1	3	*6*	*1,759*
October ...	1	121	*1*	*324*	1	362	...	...	...	...	*1*	*251*	...	...	...	...	6	2,496	*3*	*2,014*	5	531	*1*	*123*	4	576	*3*	*264*
November ...	3	1,983	*3*	*1,647*	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	883	*5*	*1,466*	2	899	*1*	*699*
December ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
January ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	8	3,183	*7*	*2,595*	*5*	2,082	*1*	*706*	8	3,425	*8*	*3,263*	3	1,754	*3*	*910*	14	4,607	*7*	*3,839*	20	2,965	*14*	*2,997*	14	5,579	*16*	*5,743*
Percentage ..	...	·49	...	·39	...	·34	...	·12	...	·88	...	·77	...	·95	...	·49	...	·74	...	·62	...	·73	...	·74	...	1·5	...	*1·90*

Months	1903-04				1904-05				1905-06				1906-07				1907-08				1908 to end of December				Remarks
Proportion	1·8 4·0		1·6 3·33		1·8 4·0		1·6 3·33		1·8 4·0		1·6 3·33		1·8 4·0		1·6 3·33		1·8 4·0		1·6 3·33		1·8 4·0		1·6 3·33		
	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	Number of days	Quantity	
	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	40	51	52	53	54
June ...	...	...	...	...	...	...	...	...	2	210	...	...	4	4,033	*4*	*3,533*	2	448	...	...	...	...	..	...	
July ...	...	...	...	...	...	...	...	...	7	3,482	*2*	*1,813*	...	...	...	...	3	750	*1*	*165*	13	5,996	7	*3,284*	
August ...	3	379	...	...	1	*74*	*1*	*55*	3	1,158	*3*	*365*	...	..	...	...	...	...	...	...	1	264	*1*	*18*	
September ...	2	356	...	..	3	2,852	*3*	*1,844*	2	372	...	...	1	143	*2*	*85*	2	877	*2*	*877*	...	...	...	...	
October ...	5	594	*3*	*1,100*	5	2,991	*3*	*2,563*	3	751	*2*	*320*	...	...	...	...	2	588	*2*	*528*	4	1,263	*1*	*83*	
November ...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	*2*	*1,476*	2	1,476	...	...	
December ...	*1*	94	*1*	*84*	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
January ...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	
Total ...	11	1,423	4	*1,184*	9	5,900	*7*	*4,462*	17	5,989	*7*	*2,498*	5	4,176	*6*	*3,618*	11	4,139	*7*	*3,046*	18	7,523	*9*	*3,385*	Total number of days 142 with 1·8 and 96 with 1·6. Average percentage 0·96 and 0·73.
Percentage ...	...	·20	...	*·19*	...	1·9	...	*1·48*	...	2·8	...	*1·19*	...	1·28	...	*1·08*	...	1·02	...	*·75*	...	2·8*	...	*1·32*	

Total number of days on which compensation is due is 142 with 1·8 and 96 with 1·6.

Exhibit Ma. 25.

Madras Note on Third Issue.

The systems of measurement under consideration have been described in the evidence and arguments and a brief recapitulation is given in Ma. 24, paragraphs 1 to 3.

2. The Madras claims are for the adoption of either—

(*a*) The "Madras System".

This system would fully ensure to Madras the "natural flow" up to the "limit-flow" of the award on the second issue.

(*b*) The "Third System" which is named by Mysore "the Proportionate System."

This system while not so advantageous to Madras as the "Madras System" is admittedly simpler of application.

3. Madras oppose the adoption of the "Mysore System" on the ground that it cannot with reasonable proportion factors safeguard Madras interests under the award on the second issue.

4. The form in which the Second Issue was stated was understood to imply an award which would allow Madras an uninterrupted "limit natural flow" measured at the Upper Anicut which would fully preserve unimpaired all the existing rights of Madras.
The award, however, specifies the limit volume of water at the Upper Anicut which, *assisted and supplemented by a proportion of all excess flow over this limit* will fully protect Madras interests.

5. This statement is, it is submitted, borne out by paragraphs 99 to 103 of the Assessor's "Examination of Evidence."

The Assessor's paragraph 165-A, last clause, suggests that if water up to the seven foot limit of the rules of 1905 should still be passed to the Delta under the award, whenever it is available, by means of the proportion of all extra flow it will be still at the disposal of Madras.

Again, in paragraphs 173 and 174, stress is laid on the element of doubt as to what proportion of the flood supplies has been and will in future actually be useful for irrigation and upon the value of a proportionate share of floods as a safeguard against error in the matter of fixing the limit gauge. A proportionate share of all floods is indeed an essential feature of the award on the second issue.

6. In the Madras arguments, Ma. 14, paragraphs 115 and 116 and Ma. 22, paragraphs 56 and 63, the expression "useful surplus" was altogether repudiated on the ground that, if natural flow *up to a limit which fully protected all Madras rights were granted*, additional flow applied to the purpose of such protection could not be useful. These arguments were obviously based on the belief and assumption that the award on the second issue must, under the terms of that issue, fix as the "limit flow," a limit which would in itself and without any extra or supplementary supplies protect Madras rights, and supply water for this purpose to protect Madras to the same extent as they would be protected under the incidence of unobstructed natural flow.

Under this understanding, the view was expressed that "useful surplus" was a contradiction in terms, and could not be required to protect Madras interests, and under this assumption Madras recognised (Ma. 22, paragraphs 55 and 65) that the Mysore System, apart from compensation clauses, was a reasonable proposal and the above are only applicable to conditions *under which surplus flow is unnecessary to protect Madras irrigation.*

7. As the award under the second issue specifically counts on surplus over the 6½ feet limit in order to secure Madras, the Madras contention as regards "useful surplus" was withdrawn as soon as the conditions of the award were declared (Ma. 24, paragraph 20).

8. The essential difference as regards the "Proportionate (third) System" and the "Mysore System" as it affects Madras, is that the former as explained by the Assessor (paragraph 103. Examination of Evidence) gives to Madras on every day in which the total natural river flow exceeds the "limit flow" a certain proportion of that extra flow, and only allows Mysore to impound the balance; while, under the Mysore System, that State impounds all this extra proportion whenever it is physically possible to do so. (*Vide* Ma. 24, paragraph 10.)

This makes a great difference to Madras under conditions in which the extra natural flow is *useful* and this is clearly shown in the statements A, B, C, and D, which will be dealt with later.

9. In the opinion of the Madras Government, the passing of a certain proportion of the extra yield of the catchment above limit flow to Madras day by day whenever it occurs under conditions of "natural flow" is essential, under the award given, for the protection of Madras, and as the Mysore system provides for passing extra water only after *Mysore reservoir* is full, or when physical conditions make it impossible to impound, the operation of the latter system must prove seriously detrimental to Madras irrigation in bad years.

10. In the years when the Mysore reservoir fills under both systems, it is no assistance to Mysore to be full in July rather than in August or September and early filling does not assist Mysore while materially affecting Madras.

11. While the differences between total quantities of water passed to Madras in certain years on either system will be small, in bad years it will be very material. What is of equal, if not of greater, importance is that the "Mysore system" allows impounding in the earlier months, in July for instance, to the great detriment of Madras supplies, but gives out in August or September when the Mysore reservoir becomes full, supplies in excess of what would be passed down in these later months under the proportionate system. This makes it appear by reference to *total extra quantities of water passed down in the year* as if the Mysore system affected Madras little, as compared with the proportionate system; but, if the matter is considered in the light of *distribution of flow*, it will be seen that Madras is far more adequately served by getting a proportion of the natural distribution of extra flow *as it occurs throughout July and August* than by having most of the extra water shut off in the earlier part of the season and being given back in larger quantities later.

12. In the years when the Mysore reservoir does not fill under the proportionate system, that is, in the bad years, and fills under the Mysore system, this is only effected by depriving Madras of the proportions of flow day by day, which affords in a bad year the only reasonable prospect which remains, under the award under the second issue, of protecting their interests (*vide* Ma. 24, paragraphs 6 to 8, and the Assessor's Examination of Evidence, paragraphs 103, 165-A, 173 and 174).

13. Prior to the award on the second issue which was expected to fully conserve Madras interests *within the limit quantity of flow forming the award under that issue*, the objections of Madras to the Mysore system were mainly directed to the very grave drawbacks of the compensation clauses of that system, and it was pointed out that, while this was a material part of the Mysore system, it was not, subject to the fixing of suitable proportion factors, an essential part of that system.

14. The objections to the Mysore system which are formulated in the Madras case are summed up in Ma. 14, paragraph 126, as below:—

(*a*) That it does not preserve their prescriptive rights as regards quantity of flow;

(*b*) that it fails in a similar manner as regards incidence of flow;

(*c*) that it will impair existing rights to full control and development of works in the basin of the Cauvery below Mysore and above the Upper Anicut;

(*d*) that it is impossible under the system proposed to make an accurate measurement of the compensation water due to Madras.

15. As regards (*a*) the matter will be treated of further, as the arguments of Madras are materially affected by the nature of the award under the second issue, an essential feature of which is the receipt by Madras day by day of a proportion of any extra flow.

16. As regards (*b*), the extent to which incidence of flow is affected during the years when the injury is at a maximum is shown in the diagrams put in by Madras (Ma. 24 g. 1-5 and Ma. 24. h. 1-5), for the co-efficients examined.

A further set of diagrams for the co-efficients proposed by Mysore, *viz.*—
·55 south-west monsoon.
·25 north-east ,,
are now produced for the same years.

These show a still more fluctuating incidence of flow and consequently still more interference with the rights of Madras.

It is to be recognised that total quantity of flow in a period is only one factor in the securing of these rights, and that Madras is materially injured by any interference which alters the incidence of flow in such a way as to make it more fluctuating than it is under natural conditions.

The Mysore system has this grave inherent defect and this is clearly shown in the diagrams (also see Ma. 14, paragraphs 117 and 118).

17. As regards (*c*) the arguments and explanations are shown in Ma. 14, paragraph 112, Ma. 22, paragraph 65.

18. As regards (*d*) Mysore have suggested in My. 21, paragraph 2, that the occasions when computation of compensation water would be impossible under the Mysore system are limited to the occasions when the working tables show *minus* discharges at the Cauvery Dam and they have applied this suggestion in their contention in paragraph 8. Paragraph 2 wrongly represents their suggestions as being the Madras view of the matter. This is not so.

The Madras contentions are that the measurement of flow at the Cauvery Dam under the Mysore system will never give the true amount of compensation water due to Madras, and that this will be inaccurate on account of varying absorption and seepage with different stages of the river and also with the variation of draw-off from the upper Madras channels.

The latter cause will entail a loss to Madras on every day when natural flow is reduced by Mysore impounding to below 6¼ feet. The matter is treated of in Ma. 14, paragraph 124, Ma. 22, paragraphs 62 and 66 to 68.

19. In the Mysore statements, My. 21, paragraph 13, it is suggested that compensation water is probably over-estimated because there is some reason to believe Madras discharges in considerable floods may be under-estimated.

My. 21, paragraph 13.

There is no basis for this contention which is only applicable to discharges in stages of river flow much below any affected by such consideration.

20. It is clear that Mysore recognise the defects of the compensation system, and they have made a suggestion for eliminating this (My. 21, paragraphs 14, 18 and 24) and proposed factors for this purpose which are larger, and on the whole more reasonable, than those they suggest in combination with the *compensation clauses*. Of the two alternatives suggested by Mysore (My. 21), that with the higher factors* and without compensation water is in the view of the Madras Government decidedly the one to be preferred. The factors suggested are, however, altogether too low to protect Madras, even if it is assumed for purposes of illustration that the "limit flow", exclusive of all extra flow, would leave Madras fully protected.

My. 21, paragraphs 14, 18 and 24.

* The factors they suggest are—
·625 south-west monsoon.
·33 north-east ,,

21. The reason which Mysore give in My. 21, paragraph 17, in favour of their system is one main reason why Madras object to it—*vide* paragraph 9 above. It is not a recommendation of the system that it is calculated to deprive Madras of their share of excess flow early in the season and give the water so taken back later if not required by Mysore.

22. The Mysore system cannot give to Madras a proportion of all excess flow which they would have enjoyed under the old conditions though in diminished quantities as formulated in paragraph 103 of the Assessor's Examination of Evidence. That paragraph concludes with the sentence "there is nothing whatever in the

evidence to show that, *provided the essential principles underlying this examination of the case are observed*, there will be any risk whatever to the vested rights of Madras" (the italics are ours).

The proportionate system provides for these principles being observed, but the Mysore system does not. It is quite clear from the above paragraph and the computations given in the Assessor's paragraph 174 that these principles are an essential feature of the award and the Madras Government believe that, unless these principles are observed, the operation of the award would, in a bad year, be disastrous to their existing interests.

23. It is significant that Mysore, in urging the adoption of the Mysore system as compared with the proportionate system, only consider the effect of such application on Mysore.

My. 21, paragraphs 20 & 21.

In the tables drawn showing the results under the proportionate system, Mysore have even omitted all figures relating to Madras and showing how it affects Madras. For this reason it has been impossible to compare in relation to Madras supplies the Mysore proportion factors under this system with those under the Mysore system.

It is submitted that the issue is, what is the method of regulation which will secure to Madras, the quantities of water to which, under the award on the second issue, they are entitled, and that of the two systems now compared the proportionate system is the one considered in making the award and the only one which can fulfil the intention of that award.

24. The results of the comparison of the two systems made in Appendix V and referred to in My. 21, paragraph 22(*a*) and (*b*) only prove that the amounts impounded under the two systems are different and have not been examined with reference to the respective shares in floods (*vide* Assessor's paragraphs 173 and 174). The following examination in this respect is therefore made.

My. 21, paragraphs 22 & 23.

Taking the same proportion of ·625 in both systems as in the specific case referred to in paragraph 22(*b*), the share of Madras in the flow from the Kannambadi catchment for stages up to 8,000 million cubic feet per diem for the south-west monsoon are given in the table below:—

Flow at Kannambadi: Million cubic feet per diem	Passed on to Madras		Share of Madras in flow from Kannambadi catchment	
	Mysore system, ·625	Proportionate system, ·625	Mysore system, ·625	Proportionate system, ·625
	M.C.FT.	M.C.FT.	PER CENT.	PER CENT.
1,219	1,219	1,219	100	100
2,000	387	1,219	19·4	61·0
2,364	*Nil.*	1,219	0·0	51·6
3,000	,,	1,219	0·0	40·6
4,000	,,	1,219	0·0	30·5
5,000	,,	1,219	0·0	24·4
6,000	,,	1,219	0·0	20·3
7,000	,,	1,219	0·0	17·4
8,000	,,	1,219	0·0	15·2

NOTE.—The limit flow of 1,950 million cubic feet at Cauvery Dam taken in My. 22, paragraph 22 (*b*), has been adopted here to agree with the Mysore figure. It ought to be 1,966 million cubic feet.

From this table, it will be seen that for the proportion examined Madras is given the whole flow up to 1,219 million cubic feet per diem under both systems and under the Mysore System, a gradually diminishing portion of the flow between 1,219 and 2,363 million cubic feet and at and above a stage indicated by the latter figure, is excluded from all share in the flow from the catchment above Kannambadi.

The proportionate system, on the other hand, gives to Madras a share in the flood water of Kannambadi catchment at all stages of the river, the percentage, which would be passed on to Madras decreasing from 100 per cent at 1,219 millions cubic feet *per diem* to 15·2 per cent at 8,000 million cubic feet *per diem*.

The passing of such proportion, is, it is submitted, altogether reasonable, and it is clear that the Assessor adopted the passing of such a proportion as an integral part of the recommendations on which the award and computations on the second issue were based (*vide* Assessor's paragraphs 99 to 103 and 173 and 174).

25. A proportion of total flow may be a reasonable way of fixing trial proportions for making trial calculations, but it is only on the incidence of daily, and half-monthly recorded flow, and the effect of the application to these of rules and trial proportions that the actual effect, on Madras, of any rules and proportions selected for trial can be estimated.

It is therefore urged that it is only from tables recording incidence of daily flow under the operation of rules and trial factors that the matter should be judged.

Further, it is altogether incorrect to argue that the total quantity of flow for an irrigation season can by itself be a measure of the effect on Madras of any rules of regulation; and incidence of flow and the extent to which natural flow within certain limits is interfered with, must be examined half-monthly and not by lumping up the flow of a whole season.

For instance, to get a disproportionate, although possibly not useless, flow in October, does not make up for a deprivation in September. It is by consideration of incidence of daily and half-monthly flow and of the effect, half-month by half-month, of the application of rules that the Madras Government look to have their interests considered.

26. Mysore propose to fix factors in consideration of *total* recorded flow of south-west and north-east *monsoon* (My. 21, paragraphs 5 and 6). This method of fixing a trial figure, at any rate as regards north-east monsoon, is misleading, because the proportion of October flow is absolutely different from that of November and December. As would be expected, the results of tables show considerable losses in October.

So long, however, as the award figures are fixed in consideration of daily and half-monthly incidence of interference or non-interference, it is not very material how the original trial figures are arrived at; but it is claimed that the factors of the award should only be fixed in consideration of the daily or half-monthly distribution and interference with the natural flow.

27. The principle enunciated above is that it is only by reference to tables of daily and half-monthly flow and by considering incidence of flow in each half-monthly period that the effect on Madras of any system or proportion factor which may be taken for trial can be effectively examined; following this principle, the Government of Madras adduce in evidence the working tables IX, X, XI, XII put in at the last meeting of the Arbitration Committee, and the abstracts of flow, Ma. 24-e and 24-f made to show by half-monthly periods the percentages of reduction of flow at the Cauvery Dam, realized under the *conditions of the tables*, within certain limits, as compared with the *recorded natural flow* within the same limits. In the abstracts originally put in, this was worked out only, for the 6½ feet limit (1,966 million cubic feet per day) of the award. The Assessor has, however, pointed out that under the conditions of this award, as specially noted in his paragraphs 173 and 174, constant replenishment must be received by Madras over and above this, and he has asked that further abstracts be prepared and the following abstracts have accordingly been prepared:—

(*a*) Abstracts on basis of total flow.
(*b*) „ „ flow limited to 2,944 million cubic feet daily.
(*c*) „ „ „ 2,300 „

The original abstracts are also available, *viz.*,

(*d*) Abstracts on basis of flow limited to 1,966 million cubic feet daily.

28. The percentages shown in these abstracts are tabulated in the attached statements (*a*), (*b*), (*c*), (*d*), for the 5 years, out of the 13 years examined, in which Madras is most affected.

In each of these statements, the results of the two systems are compared, *viz.*—

	Co-efficients.	
Mysore system without compensation water on basis of My. 21, paragraph 24 (ii).	·625	south-west monsoon.
	·33	north-east „
Proportionate system, two separate portions.	·65	south-west monsoon.
	·425	north-east „
	·60	south-west „
	·40	north-east „

29. An examination of these statements shows as regards these *systems*:—

That, for all limits in the south-west monsoon, the Mysore system, with a proportion factor of ·625, entails much more loss on Madras as compared with natural flow, than the proportionate system, even with a proportion of 0·6.

Within the limit of (7 feet on the Cauvery Dam) 2,300 million cubic feet, the losses go up to 14·3 per cent in the first half of July 1908 as against a loss of only ·35 per cent under the proportionate system.

Other comparisons are tabulated below:—

	Proportionate system.	Mysore system.
First half August 1898	5·7 per cent	10 per cent
Do 1899	3·8 „	6·1 „
Do 1905	1·6 „	6·6 „
Second half September 1904	7·4 „	13·3 „

The whole of the statements for all limits follow the same lines.

30. In the north-east monsoon, the Mysore tables for the Mysore system, are unfortunately for a lower co-efficient than any for which there are figures available under the proportionate system and the comparison is between a co-efficient of ·33 under the Mysore system and ·40 under the proportionate system.

The differences as regards the effect on Madras are again very striking and are attributable to the system rather than the co-efficients; the losses in October under all limits are very considerable.

31. The tables (*a*), (*b*), (*c*) show that with one exception the effect of the Mysore system as regards flow for limits larger than the award limit, 1,966 million cubic feet per day, is to deprive Madras of much larger percentages of total flow than they would be deprived of under the proportionate system.

The only exception is October 1898 when, under the Mysore system, the Mysore reservoir surpluses but does not surplus under the proportionate system.

Special attention is invited to tables (*b*) and (*c*) for limits 2,944 and 2,300 million cubic feet per day.

32. It is submitted that the abstracts and the statements prepared from them clearly indicate the great losses which Madras will be liable to suffer in bad years under the Mysore system.

It is brought to notice that the five years selected for examination, are those in which the Mysore system most greatly injures Madras; of these five years, four are the worst years in the whole thirteen years examined, and that these are years in which very material losses were actually incurred *under the incidence of natural flow and under rules prescribing a 7 feet minimum* being passed over the Cauvery Dam whenever available. It is contended that, under a system which reduces this flow very materially involving reductions amounting to over 14 per cent in the south-west, and 18 per cent. in the north-east monsoon on a 7 feet limit over a whole half month, Madras rights cannot but suffer very materially.

33. For this reason, the Government of Madras urge that the proportionate system should be adopted in preference to the Mysore system.

34. Coming to the question of the proportion to be tentatively fixed, the Madras Government's suggestions and remarks are to be found in Ma. 24, paragraphs 13 and 14.

The tables and abstracts then examined are now supplemented by the statements (*a*), (*b*), (*c*), (*d*), and the connected abstracts. A comparison of the figures showing losses within different limits of flow will, it is contended, support the Madras proposal for an award of tentative proportion factors of—

·65 south-west monsoon
·425 north-east „

in connection with the proportionate (third) system of regulation.

35. It is found that there are some mistakes in the Mysore working tables, Mysore system and these have been corrected.

The mistakes have been due to three causes—

(*a*) Erroneous computation of water surplused.

(*b*) Erroneous computation of draw-off for irrigation.

(*c*) Omission of the extra draw-off for filling Mysore tanks when Mysore reservoir is surplusing.

The resulting corrected figures do not very materially affect results but a statement of them is put in.

The details of corrections can, it is suggested, be checked with the Mysore Representative. It is believed that this will be found to be non-contentious matter

W. M. ELLIS, COL., R.E.,
Madras Representative.

31*st March* 1914.

Statement (a).

Comparative Statement compiled from Abstract (a).

Total flow without limit at Cauvery Dam comparing Mysore and proportionate systems in terms of percentage of diminution of natural flow received by Madras half-monthly under each system to that received by natural flow and for the proportionate factors shown.

Year		1898			1899			1904			1905			1908		
Month		Proportionate		Mysore	Proportionate		Mysore	Proportionate		Mysore	Proportionate		Mysore	Proportionate		Mysore
		·60	·650	·625	·60	.65	·625	·60	·650	·625	·60	·65	·625	·60	·65	·625
		·40	·425	·33	·40	·425	·33	·40	·425	·33	·40	·425	·33	·40	·425	·33
June ...	First half	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Second half	6·6	5·4	15·7	16·5	15·5	27·4	10·3	9·6	12·9	...	...	...	...	...	...
July ...	First half	...	...	...	11·9	10·6	16·3	4·7	5·6	3·3	5·9	5·3	11·8	30·4	28·7	42·4
	Second half	14·8	11·8	18·8	0·1	...	...	1·3	1·0	1·5	24·2	23·0	35·7	19·3	20·4	18·4
August ...	First half	21·8	19·3	28·8	3·8	1·8	6·1	5·6	4·1	8·6	7·0	5·1	12·9	3·5	3·5	3·5
	Second half	...	...	...	...	...	...	3·2	1·9	3·25	0·4	...	0·4	1·3	0·7	1·4
September ...	First half	...	...	...	...	...	...	...	...	...	0·3	...	0·2	...	...	...
	Second half	3·7	3·1	7·1	1·3	1·0	2·4	7·4	5·8	13·3	...	...	...	...	...	...
October ...	First half	7·5	6·6	15·1	...	...	...	...	...	...	...	...	...	...	...	...
	Second half	9·3	9·1	3·0	...	...	...	5·1	4·6	18·2	8·4	7·8	18·7	...	...	0·9
November ...	First half	0·05	...	1·1	...	...	...	...	...	...	...	...	...	...	...	0·9
	Second half	5·3	5·0	7·1	...	...	...	...	...	...	...	...	...	...	...	...
December ...	First half	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Second half	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Statement (b).

Comparative Statement compiled from Abstract (b).

Subject to limit flow 2,944 million cubic feet per day at Cauvery Dam comparing "Mysore" and "proportionate" systems in terms of percentage of deficiency under each which within this limit is received by Madras as compared with natural flow within the same limit.

Year		1898			1899			1904			1905			1908		
Month		Proportionate		Mysore	Proportionate		Mysore	Proportionate		Mysore	Proportionate		Mysore	Proportionate		Mysore
		·6	·6	·625	.6	·65	·625	·6	·65	·625	·6	·65	·625	·6	·65	·625
		·4	·425	·33	·4	·425	·33	·4	·425	·33	·4	·425	·33	·4	·425	·33
June ...	First half	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Second half	2·5	1·6	10·6	1·0	0·6	2·3	...	...	...	...	...	...	...	...	...
July ...	First half	...	...	...	1·3	0·9	0·5	0·5	1·6	...	3·3	2·8	9·1	9·7	8·1	22·3
	Second half	...	...	...	...	...	...	0·7	0·5	0·8	4·2	4·0	14·3	2·7	1·6	4·7
August ...	First half	7·0	5·5	16·2	3·8	1·8	6·1	...	...	0·2	6·6	4·6	12·6	...	...	...
	Second half	...	...	...	...	...	...	2·5	1·5	2·4	0·4	...	0·4	1·1	0·5	1·2
September ...	First half	...	...	...	...	...	...	...	...	...	0·3	...	0·2	...	...	...
	Second half	4·5	3·7	8·6	0·5	...	1·7	7·4	5·8	13·3	...	...	...	...	...	...
October ...	First half	3·5	3·3	7·0	...	...	...	...	...	...	...	...	...	...	...	...
	Second half	8·0	7·9	0·6	...	...	...	5·1	4·6	18·2	1·4	0·9	10·0	...	...	0·9
November ...	First half	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·9
	Second half	1·6	1·5	0·7	...	...	...	...	...	...	...	...	...	...	...	...

Statement (c).

Comparative Statement compiled from Abstract (c).

Subject to "limit flow" 2,300 million cubic feet per day at Cauvery Dam comparing "Mysore" and "proportionate" systems in terms of percentage of deficiency under each which within limit is received by Madras as compared with natural flow within the same limit.

Year	1898			1899			1904			1905			1908		
Month	Proportion		Mysore	Proportion		Mysore	Proportion		Mysore	Proportion		Mysore	Proportion		Mysore
	·6	·65	·625	·6	·65	·625	·60	·65	·625	·60	·65	·625	·6	·65	·625
	·4	·425	·33	·4	·425	·33	·40	·425	·33	·40	·425	·33	·4	·425	·33
June ... First half	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Second half	...	...	2·3	0·95	0·7	2·2	...	...	...	...	...	...	...	...	...
July ... First half	...	...	...	...	...	...	...	...	...	1·5	1·2	6·0	3·5	2·3	14·3
Second half	...	...	...	...	...	...	...	...	...	2·7	2·4	7·2	3·0	1·8	5·2
August ... First half	5·7	4·2	10·0	3·8	1·8	6·1	...	...	...	1·6	0·6	6·6	...	...	...
Second half	...	...	...	...	...	...	0·9	0·2	1·3	0·4	...	0·4	0·1	...	0·1
September ... First half	...	...	...	...	...	...	...	...	...	0·3	...	0·2	...	...	...
Second half	2·4	1·4	6·8	...	...	...	7·4	5·8	13·3	...	...	...	...	...	...
October ... First half	0·4	0·2	2·3	...	...	...	...	...	...	...	...	...	...	...	...
Second half	6·8	6·6	0·7	...	...	...	5·1	4·6	18·2	0·1	...	4·2	...	...	1·0
November ... First half	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·9
Second half	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Statement (d).

Comparative Statement compiled from abstracts subject to "limit flow" 1,966 million cubic feet at Cauvery Dam comparing "Mysore" and "proportionate" systems in terms of percentage of deficiency under each which within this limit is received by Madras as compared with natural flow within the same limit.

Year		1898			1899			1904			1905			1908		
Month		Proportion		Mysore	Proportion		Mysore	Proportion		Mysore	Proportion		Mysore	Proportion		Mysore
		·60	·65	·625	·6	·65	·625	·6	·65	·625	·6	·65	6·25	·6	·65	·625
		·40	·425	·33	·4	·425	·33	·4	·425	·33	·4	·425	·33	·4	·425	·33
June ..	First half	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Second half	...	...	...	1·0	0·7	...	...	...	...	...	...	...	...	...	...
July ...	First half	...	...	...	...	...	...	...	...	...	0·9	0·5	4·5	1·9	1·3	9·8
	Second half	...	...	...	...	...	...	...	...	...	1·5	1·2	5·6	2·0	1·0	4·3
August ...	First half	3·4	2·3	6·85	3·8	1·7	6·1	...	...	...	0·8	0·2	1·6	...	...	...
	Second half	...	...	...	...	...	...	...	...	·13	0·4	...	0·1	0·15	...	0·1
September ...	First half	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Second half	1·4	1·1	4·9	...	...	...	6·8	5·8	12·7	...	...	...	...	...	...
October	First half	...	...	0·91	...	...	...	...	...	...	...	...	...	...	...	...
	Second half	6·3	6·1	...	...	...	...	5·1	4·6	18·2	...	...	1·7	...	...	...
November .	First half	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·7
	Second half	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Ma. 25—A 1 to 13.

Copy of Abstract of Table XII.

Assessor's / *Proportionate* *System.*

Co-efficient .... {·6 south-west monsoon. / ·4 north-east

For years from 1896-1897 to 1908-1909.

Ma. 25—A1.

TABLE XII.

1896-97.

Co-efficients {0·6 / 0·4

Year and half-month	(a) Half-monthly total natural discharge of Agunda Cauvery	(a) Half-monthly total computed discharge, Agunda Cauvery, column 9 of table XII	(a) Half monthly diminution, column 2—column 3 ·6 ·4	(a) Percentage of column 4 to column 2 ·6 ·4	(a) Percentage of column 4 to column 2 ·65 ·425	(b) Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,944 m.c.ft. on any day	(b) Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table XII, limited to 2,944 m.c.ft. on any day	(b) Half-monthly diminution, column 2—column 3 ·6 ·4	(b) Percentage of column 4 to column 2 ·6 ·4	(b) Percentage of column 4 to column 2 ·65 ·425	(c) Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,300 m.c.ft. on any day	(c) Half-monthly total of computed discharge, Agunda Cauvery, column 9 of table XII, limited to 2,300 m.c.ft. on any day	(c) Half monthly diminution, column 2- column 3 ·6 ·4	(c) Percentage of column 4 to column 2 ·6 ·4	(c) Percentage of column 4 to column 2 ·65 ·425
1	2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
June ... First half	4,250	4,250	...	..	...	4,250	4,250	...	...	...	4,250	4,250	...	...	...
June ... Second ,, ...	81,248	60,257	20,991	25·83	25·83	29,215	29,215	...	...	...	23,419	23,419	...	...	...
July ... First ,, ...	68,855	66,558	2,297	3·34	3·24	37,830	37,408	422	1·12	·94	31,693	31,550	143	·45	·24
July ... Second ,, ...	133,826	130,309	3,517	2·63	2·57	43,732	43,234	498	1·14	·96	35,731	35,444	287	·81	·59
August ... First ,, ...	164,067	161,268	2,799	1·71	1·84	44,160	44,160	...	...	...	34,500	34,500	...	...	...
August ... Second ,, ...	71,385	69,714	1,671	2·34	2·01	42,890	42,254	636	1·48	·93	36,445	36,127	316	·84	·54
September ... First ,, ...	28,712	28,669	43	·15	Nil.	28,712	28,669	43	·14	...	28,386	28,343	45	·15	...
September ... Second ,, ...	19,423	19,423	...	...	...	19,423	19,423	...	...	...	19,015	19,015	...	...	...
October ... First ,, ...	31,715	30,596	1,120	3·53	3·17	29,190	28,970	220	.75	·63	25,970	25,750	220	1·37	·70
October ... Second ,, ...	11,568	11,568	...	..	...	11,568	11,568	...	...	..	11,568	11,568	...	...	...
November ... First ,, ...	6,324	6,324	...	...	...	6,324	6,324	...	...	...	6,324	6,324	...	...	...
November ... Second ,, ...	18,369	18,013	356	1 94	1·52	18,369	18,013	356	1·93	1·52	18,369	18,013	356	1·93	1·52
December ... First ,, ...	17,344	17,344	...	..	...	17,299	17,299	..	...	...	16,655	16,655	...	...	...
December ... Second ,, ...	15,703	15,703	...	...	...	15,703	15,703	...	...	...	15,703	15,703	...	...	...
January ... First ,, ...	5,690	5,690	...	...	...	5,690	5,690	...	...	...	5,690	5,690	...	..	...
January ... Second ,, ...	4,394	4,394	...	...	...	4,394	4,394	...	...	...	4,394	4,394	...	...	...

TABLE XII.

1897-1898.

Year and half-month			(a)					(b)					(c)				
			Half-monthly total natural discharge of Agunda Cauvery	Half-monthly total computed discharge, Agunda Cauvery, column 9 of table XII	Half-monthly diminution, column 2 – column 3 ·6 ·4	Percentage of column 4 to column 7 ·6 ·4	·65 ·425	Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,944 m.c.ft. on any day	Half-monthly total of computed discharge, Agunda Cauvery, column 9 of table XII, limited to 2,944 m.c.ft. on any day	Half-monthly diminution column 2—column 3 ·6 ·4	Percentage of column 4 to column 2 ·6 ·4	·65 ·425	Half-monthly total of natural discharge, Agunda, Cauvery, limited to 2,300 m.c.ft. on any day.	Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table XII, limited to 2,300 m.c.ft. on any day	Half-monthly diminution, column 2—column 3 ·6 ·4	Percentage of column 4 to column 2 6 ·4	·65 ·425
			2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
June	...	First half	5,662	5,662	...	...	...	5,662	5,662	...	...	...	5,662	5,662	...	...	...
		Second half	63,308	56,084	7,224	11·41	10·46	31,516	31,049	·467	1·50	1·10	26,111	25,822	289	1·11	·87
July	...	First ,,	54,461	45,719	8,742	16·05	15·49	22,396	22,396	...	...	...	19,176	19,176	...	..	...
		Second ,,	49,714	41,376	8,338	16·77	15·09	36,512	36,294	218	·60	·19	33,137	32,939	198	0·60	·15
August	...	First ,,	143,694	138,086	5,608	3·9	5·24	43,140	42,880	260	·60	·41	34,495	34,445	50	·15	...
		Second ,,	77,675	75,412	2,263	2·91	2·71	44,261	44,261	..	...	...	36,800	36,800	...	...	...
September	...	First ,,	43,905	42,747	1,158	2·63	2·50	36,155	35,933	222	·61	·19	32,088	31,983	105	·32	·09
		Second ,,	56,988	56,284	704	1·23	·98	33,695	33,695	...	...	...	28,130	28,130	...	...	...
October	...	First ,,	65,552	65,236	316	·48	·36	37,924	39,924	...	...	...	32,245	32,245	...	...	...
		Second ,,	36,348	35,214	1,134	·31	·28	26,722	26,168	554	2·06	1·93	23,502	23,502	...	...	...
November	...	First ,,	11,412	11,412	...	...	...	11,412	11,412	...	...	...	11,412	11,412	...	...	...
		Second ,,	6,724	6,724	...	...	...	6,721	6,724	...	...	...	6,724	6,724	...	...	...
December	...	First ,,	5,724	5,724	...	...	...	5,724	5,724	...	...	...	5,724	5,724	...	...	...
		Second ,,	3,972	3,972	...	...	...	3,972	3,972	...	..	...	3,972	3,972	...	...	...
January	...	First ,,	2,700	2,700	...	...	...	2,700	2,700	...	...	...	2,700	2,700	...	...	...
		Second ,,	2,206	2,206	...	...	...	2,206	2,206	...	...	...	2,206	2,206	...	...	...

Ma. 25—A3.

TABLE XII.

1898-1899.

Year and half month			(a) Half-monthly total of natural discharge, Agunda Cauvery	(a) Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table XII	(a) Half-monthly diminution, column 2—column 3 ·6 ·4	(a) Percentage of column 4 to column 2 ·6 ·4	(a) Percentage of column 4 to column 2 ·65 ·425	(b) Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,944 m.c.ft. on any day	(b) Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table XII, limited to 2,944 m.c.ft. on any day	(b) Half-monthly diminution, column 2—column 3 ·6 ·4	(b) Percentage of column 4 to column 2 ·4	(b) Percentage of column 4 to column 2 ·65 ·425	(c) Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,300 m.c.ft. on any day	(c) Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table XII, limited to 2,300 m.c.ft. on any day	(c) Half monthly diminution, column 2—column 3 ·6 ·4	(c) Percentage of column 4 to column 2 ·6 ·4	(c) Percentage of column 4 to column 2 ·65 ·425
1			2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
June	...	First half	4,030	4,030	...	...	...	4,030	4,030	...	...	...	4,030	4,030	...	...	...
		Second ,,	30,482	28,479	2,003	6·57	5·4	28,743	28,031	712	2·48	1·64	25,306	25,306	..	...	...
July	...	First ,,	14,340	14,340	...	...	...	14,340	14,340	...	...	...	14,340	14,340	...	...	...
		Second ,,	47,470	40,461	7,009	14·76	11·85	24,511	24,511	...	...	...	21,156	21,156	...	...	...
August	...	First ,,	43,512	34,361	9,181	21·80	19·34	34,154	31,755	2,399	7.02	5·47	31,076	29,317	1,759	5·66	4·25
		Second ,,	15,876	15,876	...	...	...	15,176	15,876	...	...	...	15,876	15,876	...	...	...
September	...	First ,,	21,181	21,181	...	...	...	20,370	20,370	...	...	...	19,726	19,726	...	...	...
		Second ,,	39,863	38,396	1,467	3·68	3·10	32,912	31,445	1,467	4·46	3·75	29,601	28,894	707	2·38	1·38
October	...	First ,,	57,823	53,483	4,340	7·5	6 66	43,148	41,895	1,533	3·53	3·27	34,500	34,356	144	·41	·24
		Second ,,	37,613	34,192	3,511	9·32	9·12	33,534	30,840	2,694	8·03	7·92	30,280	28,230	2,050	6·77	6·64
November	...	First ,,	60,450	59,417	33	·05	...	35,651	35,651	...	...	...	30,953	30.953	...	...	...
		Second ,,	43,488	41,189	2,290	5·28	5·01	28,140	27,688	452	1·60	1·50	25,291	25,291	...	...	...
December	...	First ,,	18,881	18,881	...	...	...	18,881	18,881	...	...	...	18,623	18,623	...	...	...
		Second ,,	11,142	11,142	...	...	...	11,108	11,108	...	...	...	11,142	11,142	...	...	...
January	...	First ,,	9,065	9,065	...	...	...	9,065	9,065	...	...	...	9,065	9,065	...	...	...
		Second ,,	5,486	5,486	...	...	...	5,486	5,486	...	...	..	5,486	5,486	...	...	...

Ma. 25—A4.

TABLE XII.

1899-1900.

Year and half month		(a) Half-monthly total natural discharge, Agunda Cauvery	(a) Half-monthly total computed discharge Agunda Cauvery, column 9 of table XII	(a) Half-monthly diminution, column 2—column 3 ·6 ·4	(a) Percentage of column 4 to column 2 ·6 ·4	(a) Percentage of column 4 to column 2 ·65 ·425	(b) Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,944 m.c.ft. on any day	(b) Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table XII, limited to 2,944 m.c.ft. on any day	(b) Half-monthly diminution, column 2—column 3 ·6 ·4	(b) Percentage of column 4 to column 2 ·6 ·4	(b) Percentage of column 4 to column 2 ·65 ·425	(c) Half-monthly total of natural discharge, Agunda Cauvery limited to 2,300 m.c.ft. on any day	(c) Half-monthly totals of computed discharge, Agunda Cauvery column 9 of table XII, limited to 2,300 m.c.ft. on any day	(c) Half-monthly diminution column 2—column 3 ·6 ·4	(c) Percentage of column 4 to column 2 ·6 ·4	(c) Percentage of column 4 to column 2 ·65 ·425
1		2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
June	First half	4,696	4,696	...	...	...	4,696	4,696	...	...	...	4,696	4,696	...	..	...
	Second ,,	36,063	30,096	5,967	16·55	15·55	24,467	24,227	240	·98	·58	21,247	21,045	202	·95	·67
July	First ,,	52,999	46,684	6,315	11·92	10·66	37,753	37,258	495	1·31	·91	30,919	30,919	...	...	...
	Second ,,	16,885	16,870	15	·09	...	16,885	16,885	...	...	...	16,695	16,695	...	...	...
August	First ,,	7,141	6,868	273	3·82	1·76	7,141	6,868	273	3·82	1·70	7,141	6,868	273	3·82	1·76
	Second ,,	10,588	10,588	...	...	...	10,589	10,588	...	...	...	10,588	10,588	...	...	...
September	First ,,	19,576	19,576	...	...	...	19,576	19,576	...	...	...	19,216	19,216	...	...	...
	Second ,,	28,053	27,696	357	1·27	1·00	25,563	25,444	119	·46	·02	22,574	22,574	...	...	...
October	First ,,	7,340	7,340	...	...	...	7,340	7,340	...	...	...	7,340	7,340	...	...	...
	Second ,,	10,315	10,315	...	...	...	10,315	10,315	...	...	...	10,315	10,315	...	..	...
November	First ,,	5,830	5,830	...	...	...	5,830	5,830	...	..	...	5,830	5,830	...	...	...
	Second ,,	1,501	1,501	...	...	...	1,501	1,501	...	...	...	1,501	1,501	...	..	..
December	First ,,	938	938	...	...	...	938	938	...	..	...	938	938	...	...	...
	Second ,,	482	482	...	...	...	482	482	...	...	...	482	482	...	...	...
January	First ,,	782	782	...	...	...	782	782	...	...	..	782	782	...	...	...
	Second ,,	552	552	...	...	...	552	552	...	...	...	552	552	...	...	...

Ma. 25– A5.

TABLE XII.

1900-1901.

Year and half month		(a)					(b)					(c)				
		Half-monthly total natural discharge, Agunda Cauvery	Half-monthly total computed discharge, Agunda Cauvery, column 9 of table XII	Half-monthly diminution, column 2—column 3. ·6 ·4	Percentage of column 4 to column 2 ·6 ·4	Percentage of column 4 to column 2 ·65 ·425	Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,944 m.c.ft. on any day	Half-monthly total of computed discharge, Agunda Cauvery, column 9 of table XII, limited to 2,944 m.c.ft. on any day	Half-monthly diminution, column 2—column 3. ·6 ·4	Percentage of column 4 to column 2 ·6 ·4	Percentage of column 4 to column 2 ·65 ·425	Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,300 m.c.ft. on any day	Half-monthly total of computed discharge, Agunda Cauvery, column 9 of table XII, limited to 2,300 m.c.ft. on any day	Half-monthly diminution, column 2—column 3. ·6 ·4	Percentage of column 4 to column 2 ·6 ·4	Percentage of column 4 to column 2 ·65 ·425
1		2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
June	First half	3,979	3,979	...	...	...	3,979	3,979	..	...	...	3,979	3,979	...	...	...
	Second ,,	27,103	24,357	2,746	10·13	9·25	23,272	21,801	1,471	6·32	5·55	20,696	20,030	666	3·22	2·60
July	First ,,	114,971	100,739	14,232	12·38	11·38	44,160	44,160	...	...	...	34,500	34,500	...	...	...
	Second ,,	100,955	91,626	9,329	9·24	8·60	45,501	45,501	...	...	...	36,741	36,741	...	...	...
August	First ,,	186,986	178,958	8,028	4·30	5·30	44,160	44,160	...	...	...	34,500	34,500	...	...	...
	Second ,,	91,090	88,710	2,380	2·61	2·54	38,926	38,019	907	2·33	2·17	33,556	33,240	316	·94	·76
September	First ,,	31,229	31,024	205	·65	·22	29,410	29,350	60	·20	...	27,296	27,296	...	...	...
	Second ,,	22,236	22,236	...	...	...	20,840	20,840	...	...	...	19,783	19,783	...	...	...
October	First ,,	17,927	17,765	162	·90	·54	17,116	16,954	162	·95	·57	15,919	15,757	162	1·02	·61
	Second ,,	26,685	25,833	852	3·20	2·81	23,086	22,854	232	1·00	·57	20,601	20,576	25	·12	...
November	First ,,	7,954	7,954	...	...	...	7,954	7,954	...	...	...	7,954	7,954	...	...	...
	Second ,,	5,452	5,452	...	...	...	5,452	5,452	...	...	...	5,452	5,452	...	...	...
December	First ,,	3,244	3,244	..	...	...	3,244	3,244	...	...	...	3,244	3,244	...	...	...
	Second ,,	4,116	4,116	...	...	...	4,116	4,116	...	...	...	4,116	4,116	...	...	...
January	First ,,	2,990	2,990	...	...	...	2,990	2,990	...	...	...	2,990	2,990	...	...	...
	Second ,,	2,846	2,846	...	...	...	2,846	2,846	...	...	...	2,846	2,846	...	...	...

TABLE XII.

1902-1903.

Year and half month			(a)					(b)					(c)				
			Half-monthly total of natural discharge, Agunda Cauvery	Half-monthly totals of computed discharges Agunda Cauvery, column 9 9 of table XII	Half-monthly diminution column —2 column 3 ·6 ·4	Percentage of column 4 to column 2		Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,944 m.c. ft. on any day	Half-monthly totals of computed discharge, Agunda Cauvery, column of table XII limited to 2,944 m.c. ft. on any day	Half-monthly diminution, column 2 —column 3	Percentage of column 4 to column 2		Half-monthly total of natural discharge Agunda Cauvery limited to 2,300 m.c. ft. on any day	Half-monthly totals of computed discharge Agunda Cauvery, column 9 of table XII limited to 2,300 m.c. ft. on any day	Half-monthly diminution, column 2 —column 3	Percentage of column 4 to column 2	
						·6 ·4	·65 ·425				·6 ·4	·65 ·425				·6 ·4	·65 ·425
1			2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
June	...	First half	4,910	4,910	...	...	...	4,910	4,910	...	...	...	4,910	4,910	...	...	...
		Second ,,	25,544	24,416	1,128	4·41	3·38	23,524	22,972	552	2·34	1·72	21,051	20,782	269	1·27	0·99
July	...	First ,,	76,627	56,256	20,371	26·58	25·68	30,827	30,827	...	...	...	25,031	25,031	...	...	...
		Second ,,	55,071	45,834	9,237	16·77	16·13	40,777	40,398	379	0·92	0·70	34,179	34,164	15	·04	...
August	...	First ,,	43,341	40,697	2,644	6·09	5·25	37,086	35,554	1,532	4·13	2·73	32,711	31,586	1,125	3·44	1·82
		Second ,,	38,126	36,205	1,921	5·03	4·51	33,341	32,058	1,283	3·84	3·24	30,299	29,527	772	2·54	1·67
September	...	First ,,	13,292	13,292	...	...	...	13,292	13,292	...	...	...	13,292	13,292	...	...	...
		Second ,,	26,210	26,210	...	...	...	24,700	24,700	...	...	...	22,768	22,768	...	...	...
October	...	First ,,	47,201	45,879	1,322	2·80	2·56	38,756	38,191	565	1·45	1·26	32,150	32,150	...	...	...
		Second ,,	34,896	31,506	2,881	8·37	7·65	27,731	27,433	298	1·07	1·62	23,773	23,686	87	·36	0·20
November	...	First ,,	33,896	32,456	1,440	4·25	3·70	27,690	27,359	331	1·19	0·92	24,881	24,783	98	0·38	0·23
		Second ,,	25,624	25,201	423	1·65	1·21	22,134	21,711	423	1·91	1·40	20,108	19,779	329	1·63	1·09
December	...	First ,,	8,679	8,679	...	..	...	8,679	8,679	...	...	...	8,679	8,679	...	...	...
		Second ,,	6,064	6,064	...	...	...	6,064	6,064	...	...	...	6,064	6,064	...	...	...
January	...	First ,,	6,832	6,832	...	...	...	6,832	6,832	...	...	...	6,832	6,832	...	...	...
		Second ,,	5,000	5,000	...	...	...	5,000	5,000	...	...	...	5,000	5,000	...	...	...

TABLE XII.

1902-1903.

Year and half month			(a) Half-monthly total natural discharge of Agunda Cauvery	(a) Half-monthly total computed discharge of Agunda Cauvery, column 9 of table XII	(a) Half-monthly diminution, column 2—column 3 ·6 ·4	(a) Percentage of column 4 to column 2 ·6 ·4	(a) Percentage of column 4 to column 2 ·65 ·425	(b) Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,944 m.c.ft. on any day	(b) Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table XII, limited to 2,944 m.c.ft. on any day	(b) Half-monthly diminution, column 2—column 3 ·6 ·4	(b) Percentage of column 4 to column 2 ·6 ·4	(b) Percentage of column 4 to column 2 ·65 ·425	(c) Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,300 m.c.ft. on any day	(c) Half-monthly totals of computed discharge, Agunda Cauvery column 9 of table XII limited to 2,300 m.c.ft. on any day	(c) Half-monthly diminution, column 2—column 3 ·6 ·4	(c) Percentage of column 4 to column 2 ·6 ·4	(c) Percentage of column 4 to column 2 ·65 ·425
1			2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
June	...	First half	3,568	3,568	...	...	...	3,568	3,568	...	...	...	3,568	3,568	...	...	...
		Second ,, ...	8,544	8,411	133	1·56	·85	8,544	8,411	133	1·56	·85	8,544	8,411	133	1·56	·85
July	..	First ,, ...	17,993	15,886	2,107	11·15	10·05	16,347	15,356	991	6·06	4·24	13,800	13,255	545	3·95	2·90
		Second ,, ...	98,076	75,380	22,696	23·14	23·31	41,978	39,261	2,717	6·47	5·67	35,551	34,406	1,145	3·22	2·78
August	...	First ,, ...	24,928	24,767	161	·65	·34	24,615	24,546	69	·28	...	23,046	23,046	...	...	...
		Second ,, ...	10,876	10,876	...	...	...	10,876	10,876	...	...	...	10,876	10,876	...	...	...
September	...	First ,, ...	41,681	35,516	6,165	14·78	15·08	29,862	27,603	2,259	7·56	7·31	26,360	24,953	1,407	5·34	3·41
		Second ,, ...	24,895	24,106	789	3·17	2·57	24,895	24,106	789	3·17	2·57	23,672	23,416	256	1·08	·45
October	...	First ,, ...	21,903	20,925	978	4·47	3·97	20,490	19,466	1,024	5·00	4·47	17,626	17,626	...	...	..
		Second ,, ...	34,244	33,904	340	·99	·77	29,250	29,250	...	...	...	25,675	25,675	...	...	...
November	...	First ,, ...	26,978	26,860	118	·44	...	26,776	26,658	118	·44	...	25,281	25,190	·91	·36	...
		Second ,, ...	14,475	14,475	...	...	...	14,475	14,475	...	...	...	14,475	14,475	...	...	...
December	...	First ,, ...	52,705	45,516	7,189	13·64	13·21	33,174	32,195	979	2·95	2·84	26,734	26,399	335	1·25	1·11
		Second ,, ...	19,579	19,579	...	...	...	19,579	19,579	...	...	...	19,014	19,014	...	...	...
January	...	First ,, ...	6,550	6,550	...	...	...	6,550	6,550	...	...	...	6,550	6,550	...	...	...
		Second ,, ...	5,536	5,536	...	..	...	5,536	5,536	...	...	...	5,536	5,536	...	...	...

TABLE XII.

1903-04.

Year and half month		(a) Half monthly total of natural discharge Agunda Cauvery	(a) Half monthly total of computed discharge, Agunda Cauvery, column 9 of table XII	(a) Half-monthly diminution, column 2—column 3 ·6 ·4	(a) Percentage of column 4 to column 2 ·6 ·4	(a) Percentage of column 4 to column 2 ·65 ·425	(b) Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,944 m.c.ft. on any day	(b) Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table XII, limited to 2,944 m.c.ft. on any day	(b) Half-monthly diminution, column 2—column 3 ·6 ·4	(b) Percentage of column 4 to column 2 ·6 ·4	(b) Percentage of column 4 to column 2 ·65 ·425	(c) Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,300 m.c.ft. on any day	(c) Half-monthly total of computed discharge, Agunda Cauvery, column 9 of table XII, limited to 2,300 m.c.ft. on any day	(c) Half-monthly diminution, column 2—column 3 ·6 ·4	(c) Percentage of column 4 to column 2 ·6 ·4	(c) Percentage of column 4 to column 2 ·65 ·425
1		2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
June	First half	5,786	5,786	...	...	...	5,786	5,786	...	...	...	5,786	5,786	...	...	...
	Second ,,	9,558	9,558	...	...	...	9,558	9,558	...	...	...	9,558	9,558	...	...	...
July	First ,,	8,337	8,337	...	...	...	8,837	8,337	...	...	...	7,836	7,836	...	..	...
	Second ,,	135,223	115,589	19,634	14·52	14·88	46,904	46,696	208	·44	·44	36,800	36,800	...	...	...
August	First ,,	103,488	101,195	2,293	2·21	2·07	43,372	43,208	164	·38	·38	34,356	34,356	...	...	...
	Second ,,	38,847	36,434	2,413	6·21	6·43	37,899	36,146	1,753	4·62	4·84	33,740	33,400	340	1·00	·76
September	First ,,	31,158	30,839	319	1·02	·41	31,158	30,839	319	1·02	·41	30,231	30,052	179	1·59	·15
	Second ,,	45,862	45,862	...	...	...	36,673	36,673	...	...	...	31,094	31,094	...	...	...
October	First ,,	65,007	62,163	2,844	4·37	3·78	38,136	37,749	387	1·01	·81	31,566	31,309	257	·81	·25
	Second ,,	56,746	54,995	1,751	3·08	2·68	39,890	39,644	246	·61	·52	33,654	33,654	...	...	...
November	First ,,	65,966	65,143	823	1·24	1·07	30,096	30,096	...	...	...	26,232	26,232	...	...	...
	Second ,,	62,037	57,326	4,711	7·59	8·81	33,561	33,561	...		...	29,053	29,053	...	...	...
December	First ,,	46,941	45,019	1,922	4·09	3·70	33,621	32,947	677	... 2·01	1·8	29,160	28,964	196	·67	·54
	Second ,,	11,492	11,492	...	...	...	11,492	11,492	...		...	11,492	11,492	...	...	...
January	First ,,	10,308	10,308	...	...	...	10,308	10,308	...	...	...	10,308	10,308	...	...	...
	Second ,,	3,808	3,808	...	...	...	3,808	3,808	...	...	...	3,808	3,080	...	...	...

Ma. 25—A9.

TABLE XII.

1904-1905.

Year and half-month		(a)					(b)					(c)				
		Half-monthly total of natural discharge of Agunda Cauvery	Half-monthly total of computed discharge, of Agunda Cauvery column 9 of Table XII	Half-monthly diminution, column 2—column 3 ·6 ·4	Percentage of column 4 to column 2.		Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,944 m. c. ft. on any day.	Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table XII, limited to 2,944 m. c. ft. on any day.	Half-monthly diminution column 2—column 3 ·6 ·4	Percentage of column 4 to column 2		Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,300 m. c. ft. on any day	Half-monthly totals of computed discharge, Agunda Cauvery column 9 of table XII limited to 2,300 m. c. ft. on any day	Half-monthly diminution column 2—column 3 ·6 ·4	Percentage of column 4 to column 2	
					·6 ·4	·65 ·425				·6 ·4	·65 ·425				·6 ·4	·65 ·425
1		2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
June	First half	15,178	15,178	..	...	...	15,178	15,178	...	...	..	15,178	15,178	...	...	...
	Second ,,	58,874	52,791	6,083	10·33	9·62	39,241	39,241	...	...	...	32,249	32,249	...	...	...
July	First ,,	94,906	90,416	4,490	4·73	5·64	44,160	43,920	240	·54	1·56	34,500	34,500	...	...	...
	Second ,,	45,643	45,033	610	1·33	1·00	42,495	42,184	311	·73	0·55	36,800	36,800	...	...	...
August	First ,,	41,880	39,545	2,335	5·57	4·10	35,329	35,329	...	...	...	29,533	29,533	...	...	...
	Second ,,	24,155	23,377	778	3·22	1·89	23,814	23,220	594	2·49	1·47	22,517	22,305	212	·94	·20
September	First ,,	5,940	5,940	..	...	...	5,940	5,940	...	...	...	5,940	5,940	..	...	...
	Second ,,	14,741	13,649	1,092	7·40	5·84	14,741	13,649	1,092	7·40	5·84	14,741	13,649	1,092	7·40	5·84
October	First ,,	6,674	6,674	..	...	...	6,674	6,674	...	...	...	6,674	6,674	...	...	...
	Second ,,	14,102	13,377	725	5·14	4·60	14,102	13,377	725	5·14	4·60	14,102	13,377	725	5·14	4·60
November	First ,,	5,002	5,002	...	...	...	5,002	5,002	...	...	...	5,002	5,002	...	...	...
	Second ,,	1,424	1,424	...	...	...	1,424	1,424	...	...	...	1,424	1,424	...	...	...
December	First ,,	322	322	...	...	...	322	322	...	...	...	322	322	...	...	...
	Second ,,	282	282	...	...	...	282	282	...	...	...	282	282	...	...	...
January	First ,,	240	240	...	...	...	240	240	...	...	...	240	240	...	...	...
	Second ,,	292	292	...	...	...	292	292	..	...	...	292	292	...	...	...

TABLE XII.

1905-06.

Year and half month	(a) Half-monthly total of natural discharge of Agunda Cauvery	(a) Half-monthly computed discharge—Agunda Cauvery, column 9 of table XII	(a) Half-monthly diminution, column 2—column 3 ·6 ·4	(a) Percentage of column 4 to column 2 ·6 ·4	(a) Percentage of column 4 to column 2 ·65 ·425	(b) Half-monthly total of natural discharge of Agunda Cauvery, limited to 2,944 m c.ft. on any day	(b) Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table XII limited to 2,944 m,c.ft, on any day	(b) Half-monthly diminution, column —2 column 3 ·6 ·4	(b) Percentage of column 4 to column 2 ·6 ·4	(b) Percentage of column 4 to column 2 ·65 ·425	(c) Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,944 m.c ft. on any day	(c) Half-monthly totals of computed discharge, Aganda Cauvery, column 9 of table XII, limited to 2,300 m.c.ft on any day	(c) Half-monthly diminution column —2 column 3 ·6 ·4	(c) Percentage of column 4 to column 2 ·6 ·4	(c) Percentage of column 4 to column 2 ·65 ·425
1	2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
June ... First half	4,336	4,336	...	...	...	4,336	4,336	...	...	...	4,336	4,336	...	...	...
June ... Second ,, ...	8,246	8,246	...	...	...	8,246	8,246	...	...	...	8,246	8,246	...	...	...
July ... First ,, ...	36,228	34,071	2,157	5·95	5·31	31,837	30,774	1,063	3·33	2·85	27,439	27,020	419	1·52	1·20
July ... Second ,, ...	55,980	42,485	13,495	24·16	23·01	31,410	30,084	1,326	4·22	3·97	25,614	24,932	682	2·66	2·36
August ... First ,, ...	23,932	22,262	1,670	6·97	5·06	23,830	22,262	1,568	6·58	4·65	22,298	21,937	361	1·61	·59
August ... Second ,, ...	14,509	14,449	60	·41	...	14,509	14,449	60	·41	...	14,509	14,449	60	·41	...
September ... First ,, ...	21,508	21,436	72	·33	...	21,508	21,436	72	·33	...	21,488	21,416	72	·33	...
September ... Second ,, ...	10,600	10,600	...	...	...	10,600	10,600	...	...	...	10,600	10,600	...	..	...
October ... First ,, ...	18,185	18,185	...	...	...	17,597	17,597	...	...	...	16,263	16,263	...	...	...
October ... Second ,, ...	30,384	27,818	2,566	8·44	7·82	25,272	24,923	349	1·38	·93	21,994	21,963	31	·1	..
November .. First ,, ...	4,338	4,338	..	...	...	4,338	4,338	...	...	...	4,338	4,338	...	...	...
November .. Second ,, ...	5,142	5,142	...	...	...	5,142	5,142	...	...	...	5,142	5,142	...	...	...
December ... First ,, ...	4,376	4,376	...	...	...	4,376	4,376	...	...	...	4,376	4,376	...	...	..
December ... Second ,, ...	1,974	1,974	...	...	...	1,974	1,974	...	..	...	1,974	1,974	...	...	...
January ... First ,, ...	230	230	...	...	...	230	230	...	...	...	230	230	...	...	...
January ... Second ,, ...	1,376	1,376	...	...	...	1,376	1,376	...	...	...	1,376	1,376	...	...	...

Ma. 25—A11.

TABLE XII.

1906-07.

Year and half month	(a)					(b)					(c)				
	Half-monthly total of natural discharge of Agunda Cauvery	Half-monthly total of computed discharge—Agunda Cauvery, column 9 of table XII	Half-monthly diminution, column 2—column 3 ·6 ·4	Percentage of column 4 to column 2 ·6 ·4	·65 ·425	Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,944 m.c.ft. on any day	Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table XII limited to 2,944 m.c.ft. on any day	Half-monthly diminution, column 2—column 3 ·6 ·4	Percentage of column 4 to column 2 ·6 ·4	·65 ·425	Half-monthly total of natural discharge of Agunda Cauvery, limited to 2,300 m.c.ft. on any day	Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table XII, limited to 2,300 m.c.ft. on any day	Half-monthly diminution, column 2—column 3 .6 ·4	Percentage of column 4 to column 2 ·6 .4	·65 ·125
1			2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
June ...	First half		692	692	...	...	...	692	692	...	...	...	692	692	...	...	...
	Second ,, ...		4,733	2,652	2,081	43·97	39·51	4,733	2,652	2,081	43·97	39 51	4,733	2,652	2,081	43·97	39·51
July ...	First ,, ...		5,479	5,479	...	..	...	5,479	5,479	...	...	...	5,479	5,479	...	...	...
	Second ,, ...		68,667	42,668	25,999	37·86	36·74	33,178	33,098	80	·24	·01	26,738	26,738	...	...	...
August ...	First ,, ...		40,356	38,234	2,122	5·26	7·35	31,413	34,135	278	·81	·81	30,499	30,338	161	·53	·53
	Second ,, ...		81,884	78,497	3,387	4·14	4·53	43,898	43,898	...	...	...	35,475	35,475	...	...	...
September ...	First ,, ...		40,268	38,978	1,290	3·20	2·82	32,142	31,846	296	·92	·44	28,922	28,683	239	·83	·29
	Second ,, ...		16,737	16,737	...	...	...	16,737	16,737	...	...	...	16,737	16.737	...	...	...
October ...	First ,, ...		31,000	30,943	57	·18	·06	25,340	25,340	...	...	...	21,670	21,670	...	...	...
	Second ,, ...		41,837	40,745	1,092	·261	2·25	33,348	33,348	...	...	...	26,938	26,938	...	...	...
November ...	First ,, ...		7,693	7,693	...	...	...	7,693	7,693	...	...	...	7,693	7,693	...	...	...
	Second ,, ...		13,963	13,963	...	...	...	11,762	11,762	...	...	...	10,690	10,690	...	...	...
December ...	First ,, ...		6,098	6,098	...	...	...	6,098	6,098	...	...	...	6,098	6,098	...	...	...
	Second ,, ...		8,190	,190	...	...	...	8,190	8,190	...	...	...	8,190	8,190	...	...	...
January ...	First ,, ...		,216	5,216	...	...	...	5,216	5,216	...	...	...	5,216	5,216	...	...	...
	Second ,, ...		3,238	3,238	...	...	..	3,238	3,238	...	...	...	3,238	3,238	...	...	...

TABLE XII.

1907-1908.

Year and half month	(a) Half-monthly total of natural discharge of Agunda Cauvery	(a) Half-monthly computed discharge—Agunda Cauvery column 9 of table XII	(a) Half-monthly diminution, column —2 column 3 ·6 ·4	(a) Percentage of column 4 to column 2 ·6 ·4	(a) Percentage of column 4 to column 2 ·65 ·425	(b) Half-monthly total of natural discharge of Agunda Cauvery, limited to 2,944 m.c.ft. on any day	(b) Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table XII, limited to 2,944 m.c.ft. on any day	(b) Half-monthly diminution, column 2—column 3 ·6 ·4	(b) Percentage of column 4 to column 2 ·6 ·4	(b) Percentage of column 4 to column 2 ·65 ·425	(c) Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,300 m.c.ft. on any day	(c) Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table XII, limited to 2,300 m.c.ft. on any day	(c) Half-monthly diminution, column 2—column 3 ·6 ·4	(c) Percentage of column 4 to column 2 ·6 ·4	(c) Percentage of column 4 to column 2 ·65 ·425
1	2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
June ... First half	5,066	5,066	...	...	...	5,066	5,066	...	...	...	5,066	5,066	...	...	...
June ... Second ,, ...	14,807	14,719	88	59	...	14,807	14,719	88	·59	...	14,807	14,719	88	·59	...
July ... First ,, ...	30,291	26,003	4,288	14·15	12·90	24,332	23,470	862	3·54	·14	21,671	21,560	111	·51	·16
July ... Second ,, ...	59,735	38,614	21,121	35·35	36·78	27,336	27,336	...	...	...	22,184	22,184	...	...	...
August ... First ,, ...	118,225	115,080	3,145	2·66	2·66	44,160	44,160	...	...	...	34,500	34,500	...	...	...
August ... Second ,, ...	81,831	78,455	3,376	4·12	4·12	47,101	47,101	...	...	...	36,800	36,800	...	...	...
September ... First ,, ...	32,559	32,003	556	1·77	1·42	30,060	30,042	18	·05	...	27,821	27,821	...	...	...
September ... Second ,, ...	14,531	14,531	...	...	...	14,531	14,531	...	...	...	14,024	14,024	...	...	...
October ... First ,, ...	25,074	24,280	794	3·16	2·25	24,718	24,167	551	2·22	1·45	24,004	23,870	134	·55	·24
October ... Second ,, ...	14,550	14,493	57	·39	·13	14,420	14,363	57	·39	·13	13,474	13,474	..	...	...
November ... First ,, ...	15,768	15,510	258	1·63	1·15	14,318	14,060	258	1·80	1·27	13,030	12,772	258	1·98	1·40
November ... Second ,, ...	9,133	9,133	...	...	...	9,133	9,133	...	...	...	9,133	9,133	...	...	...
December ... First ,, ...	5,070	5,070	...	...	...	5,070	5,070	...	...	...	5,070	5,070	...	...	...
December ... Second ,, ...	5,856	3,856	...	...	...	5,856	5,856	...	...	...	5,856	5,856	...	...	...
January ... First ,, ...	3,332	3,332	...	...	...	3,332	3,332	...	...	...	3,332	3,332	...	...	...
January ... Second ,, ...	3,462	3,462	...	...	...	3,462	3,462	...	...	...	3,462	3,462	...	...	...

Ma. 25—A13.

TABLE XII.

1908-1909.

Year and half-month		(a) Half-monthly total natural discharge of Agunda Cauvery	(a) Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table XII	(a) Half-monthly diminution, column 2—column 3 ·6 ·4	(a) Percentage of column 4 to column 2 ·6 ·4	(a) Percentage of column 4 to column 2 ·65 ·425	(b) Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,944 m.c.ft. on any day	(b) Half-monthly total of computed discharge, Agunda Cauvery, column 9 of table XII, limited to 2,944 m.c.ft. on any day	(b) Half-monthly diminution, column 2—column 3 ·6 ·4	(b) Percentage of column 4 to column 2 ·6 ·4	(b) Percentage of column 4 to column 2 ·65 ·425	(c) Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,300 m.c.ft. on any day	(c) Half-monthly total of computed discharge, Agunda Cauvery, column 9 of table XII, limited to 2,300 m.c.ft. on any day	(c) Half-monthly diminution, column 2—column 3 ·6 ·4	(c) Percentage of column 4 to column 2 ·6 ·4	(c) Percentage of column 4 to column 2 ·65 ·425
1		2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
June	First half	2,382	2,382	...	...	...	2,382	2,382	...	...	...	2,382	2,383	...	...	...
	Second ,,	5,270	5,270	...	...	...	5,270	5,270	...	...	...	5,270	5,270	...	...	...
July	First ,,	35,159	24,472	10,687	30·39	28·75	26,079	23,537	2,542	9·74	8·12	23,033	22,218	815	3·53	2·33
	Second ,,	78,224	63,088	15,136	19·34	20·38	41,400	40,265	1,135	2·74	1·62	34,460	33,437	1,023	2·96	1·85
August	First ,,	89,273	86,120	3,153	3·53	3·53	44,160	44,160	...	...	...	34,500	34,500	...	...	...
	Second ,,	28,368	28,002	366	1·29	0·73	28,314	28,002	312	1·10	0·54	27,440	27,400	40	0·14	...
September	First ,,	17,757	17,757	...	...	...	17,757	17,757	...	...	...	17,757	17,757	...	...	...
	Second ,,	5,964	5,965	...	...	...	5,964	5,964	...	...	...	5,964	5,964	...	...	...
October	First ,,	6,374	6,374	...	...	...	6,374	6,374	...	...	...	6,374	6,374	...	...	...
	Second ,,	15,851	15,851	...	...	...	15,548	15,548	..	...	...	14,904	14,904	...	...	...
November	First ,,	12,382	12,382	...	...	...	12,382	12,382	...	...	...	12,382	12,382	...	...	...
	Second ,,	2,546	2,546	...	...	...	2,546	2,546	..	...	...	2,546	2,546	...	...	...
December	First ,,	1,334	1,334	...	...	...	1,334	1,334	...	...	...	1,334	1,334	...	...	...
	Second ,,	1,696	1,696	...	...	...	1,696	1,696	...	...	...	1,696	1,696	...	...	...
January	First ,,	14,903	...	..	...	...	...	...	...	...	...	...	...	...	...	...
	Second ,,	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...

Ma. 25—B 1 to 13.

Copy of Abstract of Table X.

$\frac{\textit{Assessor's}}{\textit{Proportionate}}$ *System.*

Co-efficients .... { ·65 south-west monsoon.
·425 north-east ,,

For years from 1896—1897 to 1908—1909.

TABLE X.

1896-1897.

Year and half month			(a)				(b)					(c)				
			Half-monthly total of natural discharge of Agunda Cauvery	Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table X	Half-monthly diminution, column 2—column 3. 0·65 0·425	Percentage of column 4 to column 2		Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,944 m.c.ft. on any day	Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table X, limited to 2,944 m.c.ft. on any day	Half-monthly diminution, column 2—column 3. ·65 ·425	Percentage of column 4 to column 2		Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,300 m.c.ft. on any day	Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table X, limited to 2,300 m.c.ft. on any day	Half-monthly diminution, column 2—column 3. ·65 ·425	Percentage of column 4 to column 2	
						·65 ·425	·6 ·4				·65 ·425	·6 ·4				·65 ·425	·6 ·4
1			2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
June	...	First half	4,250	4,250	...	...	...	4,250	4,250	...	...	...	4,250	4,250	...	...	...
		Second „	81,248	60,259	20,989	25·83	25·83	29,215	29,215	...	...	...	23,419	23,419	...	...	...
July	...	First „	68,855	66,621	2,231	3·24	3·31	37,830	37,474	356	0·94	1·12	31,693	31,616	77	0·24	0·45
		Second „	133,826	130,376	3,450	2·57	2·63	43,732	43,310	422	0·96	1·14	35,731	35,520	211	0·59	0·81
August	...	First „	164,067	161,051	3,016	1·84	1·71	44,160	44,160	...	...	...	34,500	34,500	...	...	...
		Second „	71,385	69,947	1,438	2·01	2·34	42,890	42,487	403	0·93	1·48	36,443	36,245	198	0·54	0·84
September	...	First „	28,712	28,712	...	...	0·15	28,712	28,712	...	...	...	28,386	28,386	...	...	0·15
		Second „	19,423	19,423	...	...	...	19,423	19,423	...	...	...	19,015	19,015	...	...	...
October	...	First „	31,715	30,708	1,007	3·17	3·53	29,190	29,007	183	0·63	0·75	25,970	25,787	183	0·70	1·37
		Second „	11,568	11,568	...	...	...	11,568	11,568	...	...	...	11,568	11,568	...	...	...
November	...	First „	6,324	6,324	...	...	...	6,324	6,324	...	...	...	6,324	6,324	...	...	...
		Second „	18,369	18,089	280	1·52	1·94	18,369	18,089	280	1·52	1·93	18,369	18,089	280	1·52	1·93
December	...	First „	17,344	17,344	...	...	...	17,299	17,299	...	...	...	16,655	16,655	...	...	...
		Second „	15,703	15,703	...	...	...	15,703	15,703	...	...	...	15,703	15,703	...	...	...
January	...	First „	5,690	5,690	...	...	...	5,690	5,690	...	...	...	5,690	5,690	...	...	...
		Second „	4,394	4,394	...	...	...	4,394	4,394	...	...	...	4,394	4,394	...	...	...

Ma. 25—B2.

TABLE X.

1897–1898.

Year and half month			(a) Half-monthly total of natural discharge of Agunda Cauvery	(a) Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table X	(a) Half-monthly diminution, column 2—column 3 ·65 ·425	(a) Percentage of column 4 to column 2 ·65 ·425	(a) Percentage of column 4 to column 2 .6 ·4	(b) Half-monthly totals of natural discharge, Agunda Cauvery, limited to 2,944 m.c.ft on any day	(b) Half-monthly total of computed discharge, Agunda Cauvery, column 9 of table X, limited to 2,944 m.c.ft, on any day	(b) Half-monthly diminution, column 2—column 3 ·65 ·425	(b) Percentage of column 4 to column 2 ·65 ·425	(b) Percentage of column 4 to column 2 ·6 ·4	(c) Half-monthly totals of natural discharge, Agunda Cauvery, limited to 2,300 m.c.ft. on any day	(c) Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table X limited to 2,300 m.c.ft. on any day	(c) Half-monthly diminution, column 2—column 3 ·65 ·425	(c) Percentage of column 4 to column 2 ·65 ·425	(c) Percentage of column 4 to column 2 ·6 ·4
1			2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
June	...	First half	5,662	5,662	...	...	...	5,662	5,662	...	...	...	5,662	5,662	..	...	...
		Second ,,	63,308	56,680	6,628	10·46	11·41	31,516	31,169	347	1·10	1·50	26,111	25,882	229	0·87	1·11
July	...	First ,,	54,461	46,026	8,435	15·49	16·05	22,396	22,396	...	...	...	19,176	19,176	...	...	...
		Second ,,	49,714	42,213	7,501	15·09	16·77	36,512	36,443	69	0·19	0·60	33,137	33,088	49	0·15	0·60
August	...	First ,,	143,694	136,163	7,531	5·24	3·90	43,140	42,963	177	0·41	0·60	34,495	34,495	...	...	0·15
		Second ,,	77,675	75,566	2,109	2·71	2·91	44,261	44,261	...	...	...	36,800	36,800	...	...	...
September	...	First ,,	43,905	42,809	1,096	2·50	2·63	36,155	36,088	67	0·19	0·61	32,088	32,060	28	0·09	0·32
		Second ,,	56,988	56,430	558	0·98	1·23	33,695	33,695	...	...	...	28,130	28,130	...	...	...
October	...	First ,,	65,549	65,310	239	0·36	0·48	37,924	37,924	...	....	...	32,245	32,245	...	...	...
		Second ,,	36,348	35,328	1,020	0·28	0·31	26,722	26,206	516	1·93	2·06	23,502	23,502	...	...	...
November	...	First ,,	11,412	11,412	...	...	...	11,412	11,412	...	...	...	11,412	11,412	...	...	...
		Second ,,	6,724	6,724	...	...	...	6,724	6,724	...	...	...	6,724	6,724	...	...	...
December	...	First ,,	5,724	5,724	...	...	...	5,724	5,724	...	..	..	5,724	5,724	...	...	...
		Second ,,	3,972	3,972	...	...	...	3,972	3,972	...	...	...	3,972	3,972	...	...	...
January	...	First ,,	2,700	2,700	...	...	...	2,700	2,700	...	...	...	2,700	2,700	...	...	...
		Second ,,	2,206	2,206	...	...	...	2,206	2,206	...	...	...	2,206	2,206	...	...	...

Ma. 25—B3.

TABLE X.

1898-1899.

Year and half month			(a) Half-monthly total of natural discharge of Agunda Cauvery	(a) Half-monthly total of computed discharge, Agunda Cauvery, column 9 of table X	(a) Half-monthly diminution, column 2—column 3 ·65 ·425	(a) Percentage of column 4 to column 2 ·65 ·425	(a) Percentage of column 4 to column 2 ·6 ·4	(b) Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,944 m.c.ft. on any day	(b) Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table X, limited to 2,944 m.c.ft. on any day	(b) Half-monthly diminution, column 2—column 3 ·65 ·425	(b) Percentage of column 4 to column 2 ·65 ·425	(b) Percentage of column 4 to column 2 ·6 ·4	(c) Half-monthly totals of natural discharge, Agunda Cauvery, limited to 2,300 m.c.ft. on any day	(c) Half-monthly totals of computed discharge, Agunda Cauvery, column 9, table X, limited to 2,300 m.c.ft. on any day	(c) Half-monthly diminution, column 2—column 3 ·65 ·425	(c) Percentage of column 4 to column 2 ·65 ·425	(c) Percentage of column 4 to column 2 ·6 ·4
1			2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
June	...	First half	4,030	4,030	...	...	...	4,030	4,030	...	...	...	4,030	4,030	...	...	...
		Second ,, ...	30,482	28,836	1,646	5·4	6·57	28,743	28,269	474	1·64	2·48	25,306	25,306	...	...	...
July	...	First ,, ...	14,340	14,340	...	...	...	14,340	14,340	...	...	...	14,340	14,340	...	...	..
		Second ,, ...	47,470	41,844	5,626	11·85	14·76	24,511	24,511	...	...	...	21,156	21,156	...	...	...
August	...	First ,, ...	43,542	35,119	8,423	19·34	21·80	34,154	32,283	1,871	5·47	7·02	31,076	29,755	1,321	4·25	5·66
		Second ,, ...	15,876	15,876	....	...	...	15,876	15,876	...	...	...	15,876	15,876	...	...	...
September	...	First ,, ...	21,181	21,181	..	...	...	20,370	20,370	...	..	...	19,726	19,726	...	...	...
		Second ,, ...	39,863	38,626	1,237	3·10	3·68	32,912	31,675	1,237	3·75	4·46	29,601	29,190	411	1·38	2·38
October	...	First ,, ...	57,823	53,968	3,855	6·66	7·5	43,418	41,998	1,420	3·27	3·53	34,500	34,416	84	0·24	·41
		Second ,, ...	37,643	34,208	3,435	9·12	9·32	33,534	30,878	2,656	7·92	8·03	30,280	28,268	2,012	6·24	6·77
November	...	First ,, ...	60,450	60,450	...	...	0·05	35,651	35,651	...	...	...	30,953	30,953	...	...	...
		Second ,, ...	43,488	41,293	2,195	5·04	5·28	28,110	27,716	424	1·5	1·60	25,291	25,291	...	...	...
December	...	First ,, ...	18,881	18,881	...	...	...	18,881	18,881	...	...	...	18,623	18,623	...	...	...
		Second ,, ...	11,142	11,142	...	...	...	11,142	11,142	...	...	...	11,142	11,142	...	...	...
January	...	First ,, ...	9,065	9,065	..	...	...	9,065	9,065	...	...	...	9,065	9,065	...	...	...
		Second ,, ...	5,486	5,486	...	...	...	5,486	5,486	...	...	...	5,486	5,486	...	...	...

TABLE X.

1899-1900.

Year and half month		(a)					(b)					(c)				
		Half-monthly total natural discharge of Agunda Cauvery	Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table X	Half-monthly diminution column 2—column 3 ·65 ·425	Percentage of column 4 to column 2 ·65 ·425	Percentage of column 4 to column 2 ·6 ·4	Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,944 m. c. ft. on any day	Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table X limited to 2,944 m. c. ft. on any day	Half-monthly diminution, column 2—column 3 ·65 ·425	Percentage of column 4 to column 2 ·65 ·425	Percentage of column 4 to column 2 ·6 ·4	Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,300 m. c. ft. on any day	Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table X limited to 2,300 m. c. ft. on any day	Half-monthly diminution, column 2—column 3 ·65 ·425	Percentage of column 4 to column 2 ·65 ·425	Percentage of column 4 to column 2 ·6 ·4
1			2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
June	First half	... ...	4,696	4,696	...	...	..	4,696	4,696	...	...	...	4,696	4,696	...	...	...
	Second „	... ...	36,063	30,454	5,609	15·55	16·55	24,467	24,325	142	0·58	0·98	21,247	21,105	142	·67	·95
July	First „	... ...	52,999	47,349	5,650	10·66	11·92	37,753	37,411	342	0·91	1·31	30,949	30,949	...	...	...
	Second „	... ...	16,885	16,885	...	...	0·09	16,885	16,885	...	...	...	16,695	16,695	...	...	...
August	First „	... ...	7,141	7,015	126	1·76	3·82	7,141	7,015	126	1·76	3·82	7,141	7,015	126	1·76	3·82
	Second „	... ...	10,588	10,588	...	...	...	10,588	10,588	...	...	...	10,588	10,588	...	...	...
September	First „	... ...	19,576	19,576	...	...	...	19,576	19,576	...	...	...	19,246	19,246	...	...	...
	Second „	... ...	28,053	27,772	281	1·00	1·27	25,563	25,520	43	.02	·46	22,574	22,574	...	...	...
October	First „	... ..	7,340	7,340	...	...	..	7,340	7,340	...	...	...	7,340	7,340	...	...	...
	Second „	... ...	10,315	10,315	...	...	...	10,315	10,315	...	...	...	10,315	10,315	...	...	...
November	First „	... ...	5,830	5,830	...	...	...	5,830	5,830	...	...	...	5,830	5,830	...	...	...
	Second „	.. ...	1,504	1,504	...	...	...	1,504	1,504	...	...	...	1,504	1,504	...	...	...
December	First „	... ...	938	938	...	...	...	938	938	...	...	...	938	938	...	...	...
	Second „	... ...	482	482	...	...	...	482	482	...	...	...	482	482	...	...	...
January	First „	... ...	782	782	...	...	...	782	782	...	...	...	782	782	...	..	...
	Second „	... ..	552	552	...	...	...	552	552	...	...	...	552	552	...	...	...

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Ma. 25—B5.

TABLE X.

1900-1901.

Year and half month			(a)					(b)					(c)				
			Half-monthly total of natural discharge of Agunda Cauvery	Half-monthly total of computed discharge of Agunda Cauvery, column 9 of table X.	Half-monthly diminution, column 2—column 3.	Percentage of column 4 to column 2		Half-monthly total of natural discharge of Agunda Cauvery, limited to 2,944 m.c.ft. on any day	Half-monthly total of computed discharge of Agunda Cauvery, column 9 of table X, limited to 2,944 m.c.ft. on any day	Half-monthly diminution, column 2—column 3	Percentage of column 4 to column 2		Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,300 m.c.ft. on any day	Half-monthly total of computed discharge, Agunda Cauvery, column 9 of table X, limited to 2,300 m.c.ft. on any day	Half-monthly diminution, column 2—column 3	Percentage of column 4 to column 2	
					·65 ·425	·65 ·425	·6 ·4			·65 ·425	·65 ·425	·6 ·4			·65 ·425	·65 ·425	·6 ·4
1			2	3	4	5	6	2	3	4	5	6	2	3	4	5	
June	...	First half	3,979	3,979	...	...	...	3,979	3,979	...	...	...	3,979	3,979	...	...	...
		Second ,, ...	27,103	24,594	2,509	9·25	10·13	23,272	21,979	1,293	5·55	6·32	20,696	20,149	547	2·60	3·22
July	...	First ,, ...	114,971	101,888	13,083	11·38	12·38	44,160	44,160	...	...	...	34,500	34,500	...	...	...
		Second ,, ...	100,955	92,272	8,683	8·60	9·24	45,501	45,501	...	..	...	36,741	36,741	...	...	...
August	...	First ,, ...	186,986	177,077	9,909	5·3	4·3	44,160	44,160	...	...	...	34,500	34,500	...	...	...
		Second ,, ...	91,090	88,777	2,313	2·54	2·61	38,926	38,082	844	217	2·33	33,556	33,303	253	·76	·94
September	...	First ,, ...	31,229	31,161	68	·22	·65	29,410	29,410	...	...	·20	27,296	27,296	...	...	...
		Second ,, ...	22,236	22,236	...	...	...	20,840	20,840	...	...	...	19,783	19,783	...	...	...
October	...	First ,, ...	17,927	17,829	98	·51	0·90	17,116	17,018	98	·57	·95	15,919	15,821	98	·61	1·02
		Second ,, ...	26,685	25,934	751	2·81	3·20	23,086	22,955	131	·57	1·00	20,601	20,601	...	...	0·12
November	...	First ,, ...	7,954	7,954	...	...	...	7,954	7,954	...	...	...	7,954	7,954	...	...	...
		Second ,, ...	5,452	5,452	...	...	...	5,452	5,452	...	...	...	5,452	5,452	...	...	...
December	...	First ,, ...	3,244	3,244	...	...	...	3,244	3,244	...	...	...	3,244	3,244	...	...	...
		Second ,, ...	4,116	4,116	...	...	...	4,116	4,116	...	...	...	4,116	4,116	...	...	...
January	...	First ,, ...	2,990	2,990	...	...	...	2,990	2,990	...	...	...	2,990	2,990	...	...	...
		Second ,, ...	2,846	2,846	...	...	...	2,816	2,846	...	...	..	2,846	2,846	...	...	...

Ma. 25—B6.

TABLE X.

1901-1902.

Year and half month			(a)					(b)					(c)				
			Half-monthly total of natural discharge of Agunda Cauvery	Half-monthly total of computed discharge of Agunda Cauvery, column 9 of table X	Half-monthly diminution, column 2—column 3 ·65 ·425	Percentage of column 4 to column 2 ·65 ·425	·6 ·4	Half-monthly total of natural discharge of Agunda Cauvery, limited to 2,944 m. c. ft. on any day	Half-monthly total of computed discharge of Agunda Cauvery, column 9 of table X, limited to 2,944 m. c. ft. on any day	Half-monthly diminution, column 2—column 3 ·65 ·425	Percentage of column 4 to column 2 ·65 ·425	·6 ·4	Half-monthly total of natural discharge Agunda of Cauvery, limited to 2,300 m. c. ft. on any day	Half-monthly total of computed discharge of Agunda Cauvery, column 9 of table X, limited to 2,300 m. c. ft. on any day	Half-monthly diminution, column 2—column 3 ·65 ·425	Percentage of column 4 to column 2 ·65 ·425	·6 ·4
1			2	3	4	5	6	2	3	4	5	6	2	3	4	5	
June	...	First half	4,910	4,910	...	...	...	4,910	4,910	...	...	...	4,910	4,910	...	...	...
		Second ,, ...	25,524	24,681	863	3·38	4·41	23,521	23,118	406	1·72	2·31	21,051	20,842	209	·99	1·27
July	...	First ,, ...	76,627	56,946	19,681	25·68	26·58	30,827	30,827	...	...	...	25,031	25,031	...	...	...
		Second ,, ...	55,071	46,203	8,888	16·13	16·77	40,777	40,490	287	·70	1·92	31,179	31,179	...	...	0·04
August	...	First ,, ...	43,341	41,055	2,286	8·25	6·09	37,086	36,074	1,012	2·73	4·13	32,711	32,116	595	1·82	3·44
		Second ,, ...	38,126	36,408	1,718	4·51	5·03	33,311	32,261	1,080	3·24	3·81	30,299	29,793	506	1·67	2·54
September	...	First ,, ...	13,292	13,292	...	...	...	13,292	13,292	...	...	...	13,292	13,292	...	...	...
		Second ,, ...	26,210	26,210	...	...	...	21,700	21,700	...	...	...	22,768	22,768	...	...	...
October	...	First ,, ...	47,201	45,993	1,208	2·56	2·80	38,756	38,267	489	1·26	1·45	32,150	32,150	...	...	...
		Second ,, ...	31,387	31,756	2,631	7·65	8·37	27,731	27,281	450	1·62	1·07	23,773	23,724	49	·20	0·36
November	...	First ,, ...	33,896	32,646	1,250	3·70	4·25	27,690	27,435	255	·92	1·19	24,881	24,824	57	·23	0·38
		Second ,, ...	25,624	25,313	311	1·21	1·65	22,134	21,823	311	1·40	1·91	20,108	19,887	221	1·09	1·63
December	...	First ,, ...	8,679	8,679	...	...	...	8,679	8,679	...	...	...	8,679	8,679	...	...	...
		Second ,, ...	6,064	6,064	...	...	...	6,064	6,064	...	...	...	6,064	6,064	...	...	...
January	...	First ,, ...	6,832	6,832	...	...	...	6,832	6,832	...	...	...	6,832	6,832	...	...	...
		Second ,, ...	5,000	5,000	...	...	...	5,000	5,000	...	...	...	5,000	5,000	...	...	...

Ma. 25—B7.

TABLE X.

1902-1903.

Year and half month			(a)					(b)					(c)				
			Half-monthly total of natural discharge of Agunda Cauvery	Half-monthly total of computed discharge of Agunda Cauvery, column 9 of table X	Half-monthly diminution, column 2—column 3, ·65 ·425	Percentage of column 4 to column 2		Half-monthly total of natural discharge of Agunda Cauvery, limited to 2,944 m.c.ft. on any day	Half-monthly totals of computed discharge of Agunda Cauvery, column 9 of table X, limited to 2,944 m.c.ft. on any day	Half-monthly diminution, column 2—column 3, ·65 ·425	Percentage of column 4 to column 2		Half-monthly total of natural discharge of Agunda Cauvery, limited to 2,300 m.c.ft. on any day	Half-monthly totals of computed discharge of Agunda Cauvery, column 9 of table X, limited to 2,300 m.c.ft. on any day	Half-monthly diminution, column 2—column 3, ·65 ·425	Percentage of column 4 to column 2	
						·65 ·425	·6 ·4				·65 ·425	·6 ·4				·65 ·425	·6 ·4
1			2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
June	...	First half	3,568	3,568	0	...	...	3,568	3,568	0	0	0	3,568	3,568	0	0	0
		Second ,, ...	8,544	8,471	73	85	1·56	8,544	8,471	73	·85	1·56	8,444	8,471	73	0·85	1·56
July	...	First ,, ...	17,993	16,184	1,809	10·05	11·15	16,347	15,654	693	4·24	6·06	13,800	13,400	400	2·90	3·95
		Second ,, ...	98,076	75,215	22,861	23·31	23·14	41,978	39,596	2,382	5·67	6·47	35,551	34,562	989	2·78	3·22
August	...	First ,, ...	24,928	24,844	84	0·34	0·65	24,615	24,615	0	0	0·28	23,046	23,046	0	0	0
		Second ,, ...	10,876	10,876	0	...	...	10,876	10,876	0	0	0	10,876	10,876	0	0	0
September	...	First ,, ...	41,681	35,395	6,286	15·08	14·78	29,862	27,670	2,192	7·34	7·56	26,360	25,460	900	3·41	5·34
		Second ,, ...	24,895	24,256	639	2·59	3·17	24,895	24,256	639	2·57	3·17	23,672	23,566	106	0·45	1·08
October	...	First, ,, ...	21,903	21,033	870	3·97	4·47	20,490	19,574	916	4·47	5·00	17,626	17,626	0	0	0
		Second ,, ...	34,244	33,980	264	0·77	0·99	29,250	29,250	0	0	0	25,675	25,675	0	0	0
November	...	First ,, ...	26,978	26,978	0	...	0·44	26,776	26,776	0	0	0·44	25,281	25,281	0	0	0·36
		Second ,, ...	14,475	14,475	0	...	...	14,475	14,475	0	0	0	14,475	14,475	0	0	0
December	...	First ,, ...	52,705	45,743	6,962	13·21	13·64	33,174	32,233	941	2·84	2·95	26,734	26,437	297	1·11	1·25
		Second ,, ...	19,579	19,579	0	...	...	19,579	19,579	0	0	0	19,014	19,014	0	0*	0
Jannary	...	First ,, ...	6,550	6,550	0	...	...	6,550	6,550	0	0	0	6,550	6,550	0	0	0
		Second ,, ...	5,536	5,536	0	...	...	5,536	5,536	0	0	0	5,536	5,536	0	0	0

TABLE X.

1903-1904.

Year and half month			(a)					(b)					(c)				
			Half-monthly total of natural discharge of Agunda Cauvery	Half-monthly total of computed discharge of Agunda Cauvery, column 9 of table X	Half-monthly diminution, column 2—column 3	Percentage of column 4 to column 2		Half-monthly total natural discharge of Agunda Cauvery, limited to 2,944 m.c.ft. on any day	Half-monthly totals of computed discharge of Agunda Cauvery, column 9 of table X, limited to 2,944 m c.ft. on any day	Half-monthly diminution, column 2—column 3	Percentage of column 4 to column 2		Half-monthly total of natural discharge of Agunda Cauvery, limited to 2,300 m.c.ft. on any day	Half-monthly totals of computed discharge of Agunda Cauvery, column 9 of table X, limited to 2,300 m.c.ft. on any day	Half-monthly diminution, column 2—column 3	Percentage of column 4 to column 2	
						·65 ·425	·6 ·4			·65 ·425	·65 ·425	·6 ·4			·65 ·425	·65 ·425	·6 ·4
1			2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
June	...	First half	5,786	5,786	...	...	...	5,786	5,786	...	...	...	5,786	5,786	...	...	...
		Second ,, ...	9,558	9,558	...	...	...	9,558	9,558	...	...	...	9,558	9,558	...	...	...
July	...	First ,, ...	8,337	8,337	...	...	...	8,337	8,337	...	...	...	7,836	7,836	...	...	...
		Second ,, ...	1,35,223	115,095	20,128	14·88	14·52	46,904	46,696	208	·44	·44	36,800	36,800	...	...	...
August	...	First ,, ...	1,03,488	101,349	2,139	2·07	2·21	43,372	43,208	164	·38	·38	34,356	34,356	...	...	...
		Second ,, ...	38,847	36,351	2,496	6·43	6·21	37,899	36,063	1,836	4·84	4·62	33,740	33,483	257	·76	1·00
September	...	First ,, ...	31,158	31,029	129	·41	1·02	31,158	31,029	129	0·41	1·02	30,231	30,185	46	·15	·59
		Second ,, ...	45,862	45,862	...	...	...	36,673	36,673	...	...	...	31,094	31,094	...	...	...
October	...	First ,, ...	65,007	62,544	2,463	3·78	4·37	38,136	37,825	311	·81	1·01	31,566	31,485	81	·25	·81
		Second ,, ...	56,746	55,109	1,637	2·88	3·08	39,890	39,682	208	·52	·61	33,654	33,654	...	...	...
November	...	First ,, ...	65,966	65,257	709	1·07	1·24	30,096	30,096	...	...	...	26,232	26,232	...	...	...
		Second ,, ...	62,037	56,571	5,466	8·81	7·59	33,561	33,561	...	...	...	29,053	29,053	...	...	...
December	...	First ,, ...	46,941	45,209	1,732	3·70	4·09	33,624	33,023	601	1·80	2·01	29,160	29,002	158	·54	·67
		Second ,, ...	11,492	11,492	...	...	...	11,492	11,492	...	...	...	11,492	11,492	...	...	...
January	...	First ,, ...	10,308	10,308	...	...	...	10,308	10,308	...	...	...	10,308	10,308	...	...	...
		Second ,, ...	3,808	3,808	...	...	..	3,808	3,808	...	...	...	3,808	3,808	...	...	...

Ma. 25—B9.

TABLE X.

1904-1905.

Year and half month			(a)					(b)					(c)				
			Half-monthly total of natural discharge of Agunda Cauvery	Half-monthly total of computed discharge of Agunda Cauvery, column 9 of Table X	Half-monthly diminution, column 2—column 3	Percentage of column 4 to column 2		Half-monthly total of natural discharge of Agunda Cauvery, limited to 2,914 m.c.ft. on any day	Half-monthly totals of computed discharge of Agunda Cauvery, column 9 of table X, limited to 2,914 m.c.ft. on any day	Half-monthly diminution, column 2—column 3	Percentage of column 4 to column 2		Half-monthly total of natural discharge of Agunda Cauvery, limited to 2,300 m.c.ft. on any day	Half-monthly total of computed discharge of Agunda Cauvery, column 9 of table X, limited to 2,300 m.c.ft. on any day.	Half-monthly diminution, column 2—column 3	Percentage of column 4 to column 2	
						·65 ·425	·6 ·4				·65 ·425	·6 ·4				·65 ·425	·6 ·4
1			2	3	4	5	6	2	3	4	5	6	2	3	4	5	
June	...	First half	15,178	15,178	...	...	...	15,178	15,178	...	...	...	15,178	15,178	...	...	...
		Second ,, ...	58,874	53,207	5,667	9·62	10·33	39,241	39,241	...	...	...	32,249	32,249	...	...	...
July	...	First ,, ...	94,906	89,553	5,353	5·64	4·73	44,160	43,467	693	·56	·51	34,500	34,500	...	...	...
		Second ,, ...	45,643	45,185	458	1·00	1·33	42,495	42,260	235	0·55	0·73	36,800	36,800	...	...	...
August	...	First ,, ...	41,880	40,159	1,721	4·10	5·57	35,329	35,329	...	...	...	29,533	9,533	...	...	...
		Second ,, ...	24,155	23,697	458	1·89	3·22	23,814	23,463	351	1·47	2·49	22,517	22,471	46	0·20	0·94
September	...	First ,, ...	5,940	5,940	...	...	...	5,940	5,940	...	...	...	5,940	5,940	...	...	...
		Second ,, ...	14,741	13,880	861	5·84	7·40	14,741	13,880	861	5·84	7·40	14,741	13,880	861	5·84	7·40
October	...	First ,, ...	6,674	6,674	...	...	...	6,674	6,674	...	...	...	6,674	6,674	...	...	...
		Second ,, ...	14,102	13,453	649	4·6	5·14	14,102	1,345	649	4·60	5·14	14,102	13,453	649	4·6	5·14
November	...	First ,, ...	5,002	5,002	...	...	...	5,002	5,002	...	...	...	5,002	5,002	...	...	...
		Second ,, ...	1,424	1,424	...	...	...	1,424	1,424	...	...	...	1,424	1,424	...	...	..
December	...	First ,, ...	322	322	...	...	...	322	322	...	...	...	322	322	...	...	..
		Second ,, ...	282	282	...	...	...	282	282	...	...	...	282	282	...	...	...
January	...	First ,, ...	240	240	...	...	...	240	240	...	...	...	240	240	...	...	...
		Second ,, ...	292	292	...	...	...	292	292	...	...	...	292	292	...	...	...

Ma. 25—B10.

TABLE X.

1905-1906.

Year and half month		(a)					(b)					(c)				
		Half-monthly total of natural discharge of Agunda Cauvery	Half-monthly total of computed discharge, Agunda Cauvery, column 9 of table X	Half-monthly diminution, column 2—column 3 ·65 ·425	Percentage of column 4 to column 2		Half-monthly total of natural discharge of Agunda Cauvery, limited to 2,944 m.c.ft. on any day	Half-monthly total of computed discharge of Agunda Cauvery, column 9 of Table X, limited to 2,944 m.c.ft. on any day	Half-monthly diminution, column 2—column 3 ·65 ·425	Percentage of column 4 to column 2.		Half-monthly total of natural discharge of Agunda Cauvery, limited to 2,300 m.c.ft. on any day	Half-monthly total of computed discharge of Agunda Cauvery, column 9 of Table X, limited to 2,300 m c.ft. on any day	Half-monthly diminution, column 2—column 3 ·65 ·425	Percentage of column 4 to column 2	
					·65 ·425	·6 ·4				·65 ·425	·6 ·4				·65 ·425	·6 ·4
1		2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
June	First half	4,336	4,336	...	...	...	4,336	4,336	...	...	...	4,336	4,336	...	...	...
	Second ,,	8,246	8,246	...	...	...	8,246	8,246	..	...	...	8,246	8,246	...	...	...
July	First ,,	36,228	34,301	1,927	5·31	5·95	31,837	30,928	909	2·85	3·33	27,339	27,108	331	1·20	1·52
	Second ,,	55,980	43,098	12,882	23·01	24·16	31,110	30,161	1,249	3·97	4·22	25,614	25,009	605	2·86	2·66
August	First ,,	23,932	22,721	1,211	5·06	6·97	23,830	22,721	1,109	4·65	6·58	22,298	22,166	132	0·59	1·61
	Second ,,	14,509	14,509	...	...	0·41	14,509	14,509	...	...	0·41	14,509	14,509	.	...	·41
September	First ,,	21,508	21,508	..	...	0·33	21,508	21,508	...	...	0·33	21,188	21,188	..	...	·33
	Second ,,	10,600	10,600	...	...	...	10,600	10,600	...	...	...	10,600	10,600	...	...	...
October	First ,,	18,185	18,185	...	...	...	17,597	17,597	...	...	...	16,263	16,263	...	...	...
	Second ,,	30,381	28,005	2,379	7·82	8·44	25,272	25,035	237	0·93	1·38	21,991	21,991	...	..	·11
November	First ,,	4,338	4,338	...	...	...	4,338	4,338	...	...	...	4,338	4,338	...	...	...
	Second ,,	5,142	5,142	...	...	..	5,142	5,142	...	...	...	5,142	5,142	...	...	...
December	First ,,	4,376	4,376	...	...	...	4,376	4,376	...	...	..	4,376	4,376	...	...	...
	Second ,,	1,971	1,971	...	...	...	1,971	1,971	...	...	...	1,971	1,971	...	...	...
January	First ,,	230	230	..	...	...	230	230	...	. .	...	230	230	...	...	...
	Second ,,	1,376	1,376	...	...	...	1,376	1,376	...	...	...	1,376	1,376	...	...	...

Ma. 25—B11.

TABLE X.

1906-1907.

Year and half month		(a) Half-monthly total of natural discharge of Agunda Cauvery	(a) Half-monthly total of computed discharge, Agunda Cauvery column 9 of table X	(a) Half-monthly diminution, column 2—column 3 ·65 ·425	(a) Percentage of column 4 to column 2 ·65 ·425	(a) Percentage of column 4 to column 2 ·6 ·4	(b) Half-monthly total of natural discharge, Agunda Cauvery, limited to, 2,944 m.c.ft. on any day	(b) Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table X, limited to 2,944 m.c.ft. on any day	(b) Half-monthly diminution. column 2—column 3, ·65 ·425	(b) Percentage of column 4 to column 2 ·65 ·465	(b) Percentage of column 4 to column 2 ·6 ·4	(c) Half-monthly total of natural discharge, Agunda Cauvery. limited to 2,300 m.c.ft. on any day	(c) Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table X, limited to 2,300 m.c.ft. on any day	(c) Half-monthly, diminution, column 2—column 3, ·65 ·425	(c) Percentage of column 4 to column 2 ·65 ·425	(c) Percentage of column 4 to column 2 ·6 ·4
1		2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
June	First half	692	692	...	...	...	692	692	...	...	...	692	662	...	...	...
	Second ,,	4,733	2,863	1,870	39·51	43·97	4,733	2,863	1,870	39·51	43·97	4,733	2,863	1,870	39·51	43·97
July	First ,,	5,479	5,479	...	...	...	5,479	5,479	...	...	...	5,479	5,379	...	...	...
	Second ,,	68,667	43,437	25,230	36·74	37·86	33,178	33,175	3	·01	0·24	26,738	26,738	...	...	...
August	First ,,	40,356	37,390	2,966	7·35	5·26	34,413	34,135	278	·81	0·81	30,499	30,338	161	·53	·53
	Second ,,	81,884	78,176	3,708	4·53	4·14	43,898	43,898	...	...	...	35,475	35,575	...	...	...
September	First ,,	40,268	39,132	1,136	2·82	3·2	32,142	31,999	143	0·44	0 92	28,922	28,837	85	·29	·83
	Second ,,	16,737	16,737	...	...	...	16,737	16,737	...	...	...	16,737	16,737	...	. .	...
October	First ,,	31,000	30,981	19	·06	0·18	25,340	25,340	...	...	...	21,670	21,670	...	...	...
	Second ,,	41,837	40,897	940	2·25	2·61	33,348	33,348	...	...	...	26,938	26,938	...	...	...
November	First ,,	7,693	7,693	...	...	...	7,693	7,693	...	...	...	7,693	7,693	...	...	...
	Second ,,	13,963	13,963	...	...	...	11,762	11,762	..	...	...	10,690	10,690	...	...	...
December	First ,,	6,098	6,098	...	...	...	6,098	6,098	...	...	...	6,098	6,098	...	...	...
	Second ,,	8,190	8,190	...	...	...	8,190	8,190	...	...	...	8,190	8,190	...	...	...
January	First ,,	5,216	5,216	...	...	...	5,216	5,216	...	...	...	5,216	5,216	...	...	...
	Second ,,	3,238	3,238	...	...	...	3,238	3,238	...	...	...	3,238	3,238	...	...	...

TABLE X.

1907-1908.

Year and half month	(a) Half-monthly total of natural discharge of Agunda Cauvery	(a) Half-monthly total of computed discharge of Agunda Cauvery, column 9 of Table X	(a) Half-monthly diminution, column 2—column 3 ·65 ·425	(a) Percentage of column 4 to column 2 ·65 ·425	(a) Percentage of column 4 to column 2 ·6 ·4	(b) Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,944 m. c. ft. on any day	(b) Half-monthly totals of computed discharge, Agunda Cauvery, column 9 of table X, limited to 2,944 m. c. ft. on any day	(b) Half-monthly diminution, column 2—column 3 ·65 ·425	(b) Percentage of column 4 to column 2 ·65 ·425	(b) Percentage of column 4 to column 2 ·6 ·4	(c) Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,300 m. c. ft. on any day	(c) Half-monthly totals of computed discharge, Agunda Cauvery column 9 of table X, limited to 2,300 m. c. ft. on any day	(c) Half-monthly diminution, column 2—column 3 ·65 ·425	(c) Percentage of column 4 to column 2 ·65 ·425	(c) Percentage of column 4 to column 2 ·6 ·4
1	2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
June ... (First half	5,066	5,066	...	...	...	5,066	5,066	...	...	...	5,066	5,066	...	...	...
June ... (Second ,, ...	14,807	14,802	5	...	0·59	14,807	14,802	5	...	0·59	14,807	14,802	5	...	0·59
July ... (First ,, ...	30,291	26,386	3,905	12·90	14·15	24,392	23,810	522	2·14	3·54	21,671	21,637	34	0·16	0·51
July ... (Second ,, ...	59,735	37,762	21,973	36·78	35·35	27,336	27,336	...	...	...	22,184	22,184	...	...	...
August ... (First ,, ...	118,225	115,084	3,141	2·66	2·66	44,160	44,160	...	...	...	34,500	34,500	...	...	...
August ... (Second ,, ...	81,831	78,455	3,376	4·12	4·12	47,104	47,104	...	...	...	36,800	36,800	...	...	...
September ... (First ,, ...	32,559	32,097	462	1·42	1·72	30,060	30,060	...	...	0·05	27,821	27,821	...	...	...
September ... (Second ,, ...	14,531	14,531	...	...	...	14,531	14,531	...	...	...	14,024	14,024	...	...	...
October ... (First ,, ...	25,074	24,510	564	2·25	3·16	24,718	24,359	359	1·45	2·22	24,004	23,947	57	0·24	0·55
October ... (Second ,, ...	14,550	14,531	19	0·13	0·39	14,420	14,401	19	0·13	0·39	13,474	13,474	...	...	...
November ... (First ,, ...	15,768	15,586	182	1·15	1·63	14,318	14,136	182	1·27	1·80	13,030	12,848	182	1·40	1·98
November ... (Second ,, ...	9,133	9,133	...	...	...	9,133	9,133	...	...	...	9,133	9,133	...	...	...
December ... (First ,, ...	5,070	5,070	...	...	...	5,070	5,070	...	...	...	5,070	5,070	...	...	...
December ... (Second ,, ...	5,856	5,856	...	...	...	5,856	5,856	...	...	...	5,856	5,856	...	...	...
January ... (First ,, ...	3,332	3,332	...	...	...	3,332	3,332	...	...	...	3,332	3,332	...	...	...
January ... (Second ,, ...	3,462	3,462	...	...	...	3,462	3,462	...	...	...	3,462	3,452	...	...	...

Ma. 25—B13.

TABLE X.

1908-09.

Year and half month		(a) Half-monthly total of natural discharge of Agunda Cauvery	(a) Half-monthly total of computed discharge of Agunda Cauvery, column 9 of table X	(a) Half-monthly diminution, column 2—column 3 ·65 ·425	(a) Percentage of column 4 to column 2 ·65 ·425	(a) Percentage of column 4 to column 2 ·6 ·4	(b) Half-monthly total of natural discharge of Agunda Cauvery, limited to 2,944 m.c.ft. on any day	(b) Half-monthly totals of computed discharge of Agunda Cauvery, column 9 of table X, limited to 2,944 m.c.ft. on any day	(b) Half-monthly diminution, column 2—column 3 ·65 ·425	(b) Percentage of column 4 to column 2 ·65 ·425	(b) Percentage of column 4 to column 2 ·6 ·4	(c) Half-monthly total of natural discharge of Agunda Cauvery limited to 2,300 m.c.ft. on any day	(c) Half-monthly totals of computed discharge of Agunda Cauvery, column 9 of table X, limited to 2,300 m.c.ft. on any day	(c) Half-monthly diminution, column 2—column 3 ·65 ·425	(c) Percentage of column 4 to column 2 ·65 ·425	(c) Percentage of column 4 to column 2 ·6 ·4
1		2	3	4	5	6	2	3	4	5	6	2	3	4	5	6
June	First half	2,382	2,382	Nil	...	...	2,382	2,382	Nil	...	...	2,382	2,382	Nil	...	...
	Second ,,	5,270	5,270	,,	...	...	5,270	5,270	,,	...	...	5,270	5,270	,,	...	...
July	First ,,	35,159	25,049	10,110	28·75	30·39	26,079	23,960	2,119	8·12	9·74	23,033	22,495	538	2·33	3·53
	Second ,,	78,221	62,276	15,948	20·38	19·31	41,400	40,726	674	1·62	2·74	34,460	33,821	639	1·85	2·96
August	First ,,	89,273	86,120	3,153	3·53	3·53	44,160	44,160	Nil	...	...	31,500	31,500	Nil	...	...
	Second ,,	28,368	28,159	209	0·73	1·29	28,314	28,159	155	·51	1·10	27,110	27,410	,,	...	0·11
September	First ,,	17,757	17,757	Nil	...	...	17,757	17,757	Nil	...	...	17,757	17,757	,,	...	...
	Second ,,	5,961	5,964	,,	...	...	5,961	5,964	,,	...	...	5,961	5,961	,,	...	...
October	First ,,	6,371	6,374	,,	...	...	6,371	6,371	,,	...	...	6,371	6,374	,,	...	...
	Second ,,	15,851	15,851	,,	...	...	15,548	15,548	,,	...	...	14,901	14,904	,,	...	...
November	First ,,	12,382	12,382	,,	...	...	12,382	12,382	,,	...	...	12,382	12,382	,,	...	...
	Second ,,	2,546	2,546	,,	...	...	2,546	2,546	,,	...	...	2,546	2,546	,,	...	...
December	First ,,	1,331	1,331	,,	...	...	1,331	1,331	,,	...	...	1,331	1,331	,,	...	...
	Second ,,	1,696	1,696	,,	...	...	1,696	1,696	,,	...	...	1,696	1,696	,,	...	...
January	First ,,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Second ,,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Ma. 25—C 1 to 5.

Copy of Abstract of Table III.

MYSORE SYSTEM.

(*Corrected Tables.*)

Co-efficients .... { 625 south-west monsoon.
33 north-east

For the years .... { 1898-1899.
1899-1900.
1904-1905.
1905-1906.
1908-1909.

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Ma. 25—C1.

MYSORE SYSTEM.

1898-1899.

Year and half month			(a) Half-monthly total of natural discharge of Agunda Cauvery	Half-monthly total of computed discharge, Agunda Cauvery, column 5 of table III	Half-monthly diminution, column 2 — column 3 ·625 ·33	Percentage of column 4 to column 2 ·625 ·33	—
1			2	3	4	5	6
June	First half	... ...	4,030	4,030	...	...	...
	Second ,,	... ...	30,482	25,697	4,785	15·69	...
July	First ,,	... ...	14,340	14,340	...	...	...
	Second ,,	... ...	47,470	38,540	8,930	18·81	...
August	First ,,	... ...	43,542	31,009	12,533	28·78	...
	Second ,,	... ...	15,876	15,876	...	...	...
September	First ,,	... ...	21,181	21,181	...	...	...
	Second ,,	... ...	39,863	37,024	2,839	7·12	...
October	First ,,	... ...	57,823	49,079	8,744	15·12	...
	Second ,,	... ...	37,643	36,520	1,123	2·98	...
November	First ,,	... ...	60,450	59,798	652	1·08	...
	Second ,,	... ...	43,480	40,377	3,103	7·13	...
December	First ,,	... ...	18,881	18,881	...	...	...
	Second ,,	... ...	11,142	11,142	...	...	..
January	First ,,	... ...	9,065	9,065	...	...	...
	Second ,,	... ...	5,486	5,486	...	...	...

Year and half month			(b) Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,944 m.c.ft. on any day	Half-monthly total of computed discharge, Agunda Cauvery, column 5 of table III, limited to 2,911 m.c.ft. on any day	Half-monthly diminution, column 2 — column 3 ·625 ·33	Percentage of column 4 to column 2 ·625 ·33	—
1			2	3	4	5	6
June	First half	... ...	4,030	4,030	...	...	...
	Second ,,	... ...	28,743	25,697	3,046	10·59	...
July	First ,,	... ...	14,340	14,340	...	...	...
	Second ,,	... ...	21,511	21,511	...	...	...
August	First ,,	... ...	34,151	28,612	5,542	16·23	...
	Second ,,	... ...	15,876	15,876	...	...	...
September	First ,,	... ...	20,370	20,370	...	...	...
	Second ,,	... ...	32,912	30,073	2,839	8·62	...
October	First ,,	... ...	43,118	40,374	3,044	7·01	...
	Second ,,	... ...	33,534	33,324	210	·62	...
November	First ,,	... ...	35,651	35,651	...	...	...
	Second ,,	... ...	28,140	27,929	211	·75	...
December	First ,,	... ...	18,881	18,881	...	...	...
	Second ,,	... ...	11,142	11,142	...	...	...
January	First ,,	... ...	9,065	9,065	...	...	...
	Second ,,	... ...	5,486	5,486	...	...	...

Ma. 25—C1.—concld.

Year and half month		(c) Half-monthly total of natural discharge of Agunda Cauvery, limited to 2,300 m.c.ft. on any day	Half-monthly totals of computed discharge, Agunda Cauvery, column 5 of table III limited to 2,300 m.c.ft. on any day	Half-monthly diminution, column 2 — column 3	Percentage of column 4 to 3 column 2 ·625 ·33	—
1		2	3	4	5	6
June	First half	4,030	4,030	...	...	...
	Second ,,	25,306	24,715	591	2·34	...
July	First ,,	14,340	14,340	...	...	...
	Second ,,	21,156	21,156	...	...	...
August	First ,,	31,076	27,968	3,108	10·00	...
	Second ,,	15,876	15,876	...	...	...
September	First ,,	19,726	19,726	...	...	...
	Second ,,	29,601	27,588	2,013	6·80	...
October	First ,,	34,500	33,704	796	2·31	...
	Second ,,	30,280	30,070	210	·69	...
November	First ,,	30,953	30,953	...	...	...
	Second ,,	25,291	25,291	...	...	...
December	First ,,	18,623	18,623	...	...	...
	Second ,,	11,142	11,142	...	...	...
January	First ,,	9,065	9,065	...	...	...
	Second ,,	5,486	5,486	...	..	...

Year and half month		(d) Half-monthly total of natural discharge, Agunda Cauvery, limited to 1,966 m.c.ft. on any day	Half-monthly total of computed discharge, Agunda Cauvery, column 5 of table III, limited to 1,966 m.c.ft. on any day	Half-monthly diminution, column 2 — column 3	Percentage of column 4 to 3 column 2 ·625 ·33	—
1		2	3	4	5	6
June	First half	4,030	4,030	...	...	...
	Second ,,	22,955	22,955	...	...	...
July	First ,,	14,340	14,340	...	...	...
	Second ,,	19,152	19,152	...	...	...
August	First ,,	28,321	26,480	1,941	6·85	...
	Second ,,	15,876	15,876	...	...	...
September	First ,,	19,086	19,086	...	...	...
	Second ,,	27,175	25,830	1,345	4·95	...
October	First ,,	29,490	29,223	267	·91	...
	Second ,,	27,392	27,392	..	...	...
November	First ,,	27,921	27,921	...	...	...
	Second ,,	23,467	23,467	...	...	...
December	First ,,	17,924	17,924	...	...	...
	Second ,,	11,008	11,008	...	...	...
January	First ,,	9,065	9,065	...	...	...
	Second ,,	5,486	5,486	...	...	...

Ma. 25—C2.

MYSORE SYSTEM.

1899-1900.

Year and half month		(a)				
		Half-monthly total of natural discharge of Agunda Cauvery	Half-monthly total of computed discharge, Agunda Cauvery, column 5 of table III	Half-monthly diminution, column 2—column 3 ·625 ·33	Percentage of column 4 to column 2	
					·625 ·33	—
1		2	3	4	5	6
June	First half	1,696	4,696	...	...	...
	Second ,,	36,063	26,171	9,892	27·43	...
July	First ,,	52,999	44,359	8,640	16·30	...
	Second ,,	16,885	16,885	...	...	...
August	First ,,	7,141	6,705	436	6·10	...
	Second ,,	10,588	10,588	...	...	...
September	First ,,	19,576	19,576	...	...	...
	Second ,,	28,053	27,379	674	2·40	...
October	First ,,	7,340	7,340	...	...	...
	Second ,,	10,315	10,315	...	...	...
November	First ,,	5,830	5,830	...	...	...
	Second ,,	1,504	1,504	...	...	...
December	First ,,	938	938	...	...	...
	Second ,,	482	482	...	...	...
January	First ,,	782	782	...	...	...
	Second ,,	552	552	...	...	...

Year and half month		(b)				
		Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,911 m.c. ft. on any day	Half-monthly totals of computed discharge, Agunda Cauvery, column 5 of table III, limited to 2,914 m.c.ft. on any day	Half-monthly diminution, column 2—column 3 ·625 ·33	Percentage of column 4 to column 2	
					·625 ·33	—
1		2	3	4	5	6
June	First half	4,696	4,696	...	...	...
	Second ,,	24,467	23,836	631	2·58	...
July	First ,,	37,753	37,544	209	·55	...
	Second ,,	16,885	16,885	...	...	...
August	First ,,	7,141	6,705	436	6·10	...
	Second ,,	10,588	10,588	...	...	...
September	First ,,	19,576	19,576	...	...	...
	Second ,,	25,563	25,127	436	1·70	...
October	First ,,	7,340	7,340	...	...	...
	Second ,,	10,315	10,315	...	...	...
November	First ,,	5,830	5,830	...	...	...
	Second ,,	1,504	1,504	...	...	...
December	First ,,	938	938	...	...	...
	Second ,,	482	482	...	...	...
January	First ,,	782	782	...	...	...
	Second ,,	552	552	...	...	...

Ma. 25—C2—concld.

Year and half month		(c)				
		Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,300 m. c. ft. on any day	Half-monthly totals of computed discharge, Agunda Cauvery, column 5 of table III, limited to 2,300 m. c. ft. on any day	Half-monthly diminution, column 2—column 3 ·625 ·33	Percentage of column 4 to column 2	
					·625 ·33	—
1		2	3	4	5	6
June	First half	4,696	4,696	...	...	...
	Second ,,	21,247	20,773	474	2·23	...
July	First ,,	30,949	30,949	...	...	...
	Second ,,	16,695	16,695	...	...	...
August	First ,,	7,141	6,705	436	6·10	...
	Second ,,	10,588	10,588	...	...	...
September	First ,,	19,246	19,246	...	...	...
	Second ,,	22,574	22,574	...	...	...
October	First ,,	7,340	7,340	...	...	...
	Second ,,	10,315	10,315	...	...	...
November	First ,,	5,830	5,830	...	...	...
	Second ,,	1,504	1,504	...	...	...
December	First ,,	938	938	...	...	...
	Second ,,	482	482	...	...	...
January	First ,,	782	782	...	...	...
	Second ,,	552	552	...	...	...

Year and half month		(d)				
		Half-monthly total of natural discharge, Agunda Cauvery, limited to 1,966 m. c. ft. on any day	Half-monthly totals of computed discharge, Agunda Cauvery, column 5 of table III, limited to 1,966 m. c. ft. on any day	Half-monthly diminution, column 2—column 3 ·625 ·33	Percentage of column 4 to column 2	
					·625 ·33	—
1		2	3	4	5	6
June	First half	4,696	4,696	...	...	...
	Second ,,	19,248	19,248	...	...	...
July	First ,,	26,612	26,612	...	...	...
	Second ,,	16,330	16,330	...	...	...
August	First ,,	7,141	6,705	436	6·10	...
	Second ,,	10,588	10,588	...	...	...
September	First ,,	18,511	18,511	...	...	...
	Second ,,	20,691	20,691	...	...	...
October	First ,,	7,340	7,340	...	..	...
	Second ,,	10,315	10,315	...	...	...
November	First ,,	5,830	5,830	...	...	...
	Second ,,	1,504	1,504	...	...	...
December	First ,,	938	938	...	...	...
	Second ,,	482	482	...	...	..
January	First ,,	782	782	...	...	...
	Second ,,	552	552	...	...	...

Ma. 25—C3.

MYSORE SYSTEM.

1904-1905.

Year and half month	(a) Half-monthly total of natural discharge of Agunda Cauvery	(a) Half-monthly total of computed discharge of Agunda Cauvery, column 5 of table III	(a) Half-monthly diminution, column 2—column 3	(a) Percentage of column 4 to column 2 ·625 ·33	(a) Percentage of column 4 to column 2 —
1	2	3	4	5	6
June ... First half	15,178	15,178	...	...	...
June ... Second ,, ...	58,874	51,261	7,613	12·93	...
July ... First ,, ...	94,906	91,737	3,169	3·34	...
July ... Second ,, ...	45,643	44,959	684	1·50	...
August ... First ,, ...	41,880	38,260	3,620	8·64	...
August ... Second ,, ...	24,155	23,370	785	3·25	...
September ... First ,, ...	5,940	5,940	...	...	...
September ... Second ,, ...	14,741	12,777	1,964	13·32	...
October ... First ,, ...	6,674	6,674	...	...	...
October ... Second ,, ...	14,102	11,539	2,563	18·17	...
November ... First ,, ...	5,002	5,002	...	...	...
November ... Second ,, ...	1,424	1,424	...	...	...
December ... First ,, ...	322	322	...	...	...
December ... Second ,, ...	282	282	...	...	...
January ... First ,, ...	240	240	...	...	...
January ... Second ,, ...	292	292	...	...	...

Year and half month	(b) Half-monthly total of natural discharge of Agunda Cauvery, limited to 2,944 m.c.ft. on any day	(b) Half-monthly totals of computed discharge of Agunda Cauvery, column 5 of table III limited to 2,944 m.c ft. on any day	(b) Half-monthly diminution, column 2—column 3	(b) Percentage of column 4 to column 2 ·625 ·33	(b) Percentage of column 4 to column 2 —
1	2	3	4	5	6
June ... First half	15,178	15,178	...	...	...
June ... Second ,, ...	39,241	39,241	...	...	...
July ... First ,, ...	44,160	44,160	...	...	
July ... Second ,, ...	42,495	42,141	354	·83	
August ... First ,, ...	35,329	35,250	79	·22	
August ... Second ,, ...	23,814	23,240	574	2·41	
September ... First ,, ...	5,940	5,940	...	...	
September ... Second ,, ...	14,741	12,777	1,964	13·32	
October ... First ,, ...	6,671	6,674	...	...	
October ... Second ,, ...	14,102	11,539	2,563	18·17	
November ... First ,, ...	5,002	5,002	...	...	
November ... Second ,, ...	1,424	1,424	...	...	
December ... First ,, ...	322	322	...	...	
December ... Second ,, ...	282	282	...	...	
January ... First	240	240	...	...	
January ... Second ,, ...	292	292	...	...	

Ma. 25—C3.—concld.

Year and half month		(c)				
		Half-monthly total of natural discharge of Agunda Cauvery, limited to 2,300 m.c.ft. on any day	Half-monthly totals of computed discharge of Agunda Cauvery, column 5 of table III, limited to 2,300 m.c.ft. on any day	Half-monthly diminution, column 2—column 3 ·625 ·33	Percentage of column 4 to column 2	
					·625 ·33	—
1		2	3	4	5	6
June	First half	15,178	15,178	...	...	..
	Second ,,	32,249	32,249	...	...	...
July	First ,,	34,500	34,500	...	...	...
	Second ,,	36,800	36,800	...	...	...
August	First ,,	29,533	29,533	...	...	...
	Second ,,	22,517	22,224	293	1·30	...
September	First ,,	5,940	5,940	...	...	...
	Second ,,	14,741	12,777	1,964	13·32	...
October	First ,,	6,674	6,674	...	...	...
	Second ,,	14,102	11,539	2,563	18·17	...
November	First ,,	5,002	5,002	...	...	...
	Second ,,	1,424	1,424	...	...	...
December	First ,,	322	322	...	...	...
	Second ,,	282	282	...	...	...
January	First ,,	240	240	...	...	...
	Second ,,	292	292	...	...	...

Year and half month		(d)				
		Half-monthly total of natural discharge of Agunda Cauvery, limited to 1,966 m.c.ft. on any day	Half-monthly totals of computed discharge of Agunda Cauvery, column 5 of table III, limited to 1,966 m.c.ft. on any day	Half-monthly diminution, column 2—column 3 ·625 ·33	Percentage of column 4 to column 2	
					·625 ·33	—
1		2	3	4	6	7
June	First half	15,178	15,178	...	...	...
	Second ,,	28,274	28,274	...	...	...
July	First ,,	29,490	29,490	...	...	...
	Second ,,	31,349	31,347	...	...	...
August	First ,,	26,491	26,491	...	...	...
	Second ,,	21,212	21,184	28	·13	...
September	First ,,	5,940	5,940	...	...	...
	Second ,,	14,637	12,777	1,860	12·71	...
October	First ,,	6,674	6,674	...	...	..
	Second ,,	14,102	11,539	2,563	18·17	...
November	First ,,	5,002	5,002	...	...	...
	Second ,,	1,424	1,424	...	...	...
December	First ,,	322	322	...	...	...
	Second ,,	282	282	...	...	...
January	First ,,	240	240	...	...	...
	Second ,,	292	292	...	...	...

Ma. 25—C4.

MYSORE SYSTEM.

1905-1906.

Year and half month		(a) Half-monthly total of natural discharge of Agunda Cauvery	Half-monthly total of computed discharge of Agunda Cauvery, column 5 of table III	Half-monthly diminution, column 2—column 3 ·625 ·33	Percentage of column 4 to column 2 ·625 ·33	—
1		2	3	4	5	6
June ...	First half	4,336	4,336	...	...	...
	Second ,, ...	8,246	8,246	...	...	...
July ...	First ,, ...	36,228	31,966	4,262	11·76	...
	Second ,, ...	55,980	36,003	19,977	35·69	...
August ...	First ,, ...	23,932	20,835	3,097	12·94	...
	Second ,, ...	14,509	14,449	60	·41	...
September ...	First ,, ...	21,508	21,469	39	·18	...
	Second ,, ...	10,600	10,600	...	...	...
October ...	First ,, ...	18,185	18,185	...	...	...
	Second ,, ...	30,384	24,694	5,690	18·73	...
November ...	First ,, ...	4,338	4,338	...	...	...
	Second ,, ...	5,142	5,142	...	...	...
December ...	First ,, ...	4,376	4,376	...	...	...
	Second ,, ...	1,974	1,974	...	...	...
January ...	First ,, ...	230	230	...	...	...
	Second ,, ...	1,376	1,376	...	...	...

Year and half month		b Half-monthly total of natural discharge of Agunda Cauvery, limited to 2,944 m.c.ft. on any day	Half-monthly totals of computed discharge of Agunda Cauvery, column 5 of table III, limited to 2,944 m.c.ft. on any day	Half-monthly diminution, column 2—column 3 ·625 ·33	Percentage of column 4 to column 2 ·625 ·33	—
1		2	3	4	5	6
June ...	First half	4,336	4,336	...	...	...
	Second ,, ...	8,246	8,246	...	...	...
July ...	First ,, ...	31,837	28,925	2,912	9·14	...
	Second ,, ...	31,410	26,928	4,482	14·27	...
August ...	First ,, ...	24,830	20,835	2,995	12·57	...
	Second ,, ...	14,509	14,449	60	·41	...
September ...	First ,, ...	21,508	21,469	39	·18	...
	Second ,, ...	10,600	10,600	...	...	...
October ...	First ,, ...	17,597	17,597	...	...	...
	Second ,, ...	25,272	22,746	2,526	9·99	...
November ...	First ,, ...	4,338	4,338	...	...	...
	Second ,, ...	5,142	5,142	...	...	...
December ...	First ,, ...	4,376	4,376	...	...	...
	Second ,, ...	1,974	1,974	...	...	...
January ...	First ,, ...	230	230	...	...	...
	Second ,, ...	1,376	1,376	...	...	...

Ma. 25—C4—concld.

Year and half month	(c) Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,300 m.c.ft. on any day	(c) Half-monthly totals of computed discharge, Agunda Cauvery, column 5 of table III, limited to 2,300 m.c.ft. on any day	(c) Half-monthly diminution, column 2—column 3	(c) Percentage of column 4 to column 2 ·625 ·33	(c) Percentage of column 4 to column 2 —
1	2	3	4	5	6
June ... First half	4,336	4,336	...	...	...
Second ,,	8,246	8,246	...	...	...
July ... First ,,	27,439	25,786	1,653	6·02	...
Second ,,	25,614	23,781	1,833	7·16	...
August ... First ,,	22,298	20,835	1,463	6·56	...
Second ,,	14,509	14,449	60	·41	...
September ... First ,,	21,488	21,449	39	·18	...
Second ,,	10,600	10,600	...	...	...
October ... First ,,	16,263	16,263	...	...	...
Second ,,	21,994	21,080	914	4·16	...
November ... First ,,	4,338	4,338	...	...	...
Second ,,	5,142	5,142	...	...	...
December ... First ,,	4,376	4,336	...	...	...
Second ,,	1,974	1,974	...	...	...
January ... First ,,	230	230	...	...	...
Second ,,	1,376	1,376	...	...	...

Year and half month	(d) Half-monthly total of natural discharge, Agunda Cauvery, limited to 1,966 m.c.ft. on any day	(d) Half-monthly totals of computed discharge, Agunda Cauvery column 5 of table III, limited to 1,966 m.c.ft. on any day	(d) Half-monthly diminution, column 2—column 3	(d) Percentage of column 4 to column 2 ·625 ·33	(d) Percentage of column 4 to column 2 —
1	2	3	4	5	6
June ... First half	4,336	4,336	...	...	...
Second ,,	8,246	8,246	...	...	...
July ... First ,,	24,853	23,728	1,125	4·52	...
Second ,,	22,608	21,347	1,261	5·58	...
August ... First ,,	20,598	20,277	321	1·56	...
Second ,,	14,509	14,449	60	·41	...
September ... First ,,	21,031	21,031	...	...	...
Second ,,	10,600	10,600	...	...	...
October ... First ,,	14,823	14,823	...	...	...
Second ,,	19,656	19,320	336	1·71	...
November ... First ,,	4,338	4,338	...	...	...
Second ,,	5,142	5,142	...	...	...
December ... First ,,	4,376	4,376	...	...	...
Second ,,	1,974	1,974	...	...	...
January ... First ,,	230	230	...	...	...
Second ,,	1,376	1,376	..	...	...

Ma. 25—C5.

MYSORE SYSTEM.

1908-09.

(*a*)

Year and half month		Half-monthly total of natural discharge, Agunda Cauvery	Half-monthly total of computed discharge, Agunda Cauvery, column 5 of table III	Half-monthly diminution, column 2—column 3 ·625 ·33	Percentage of column 4 to column 2	
					·625 ·33	—
1		2	3	4	5	6
June	First half	2,382	2,382	.....	.....	.....
	Second ,,	5,270	5,270	.....	.....	.....
July	First ,,	35,159	20,252	14,907	42·40	.....
	Second ,,	78,224	63,809	14,415	18·43	.....
August	First ,,	89,273	86,120	3,153	3·53	.....
	Second ,,	28,368	27,966	402	1·42	.....
September	First ,,	17,757	17,757	.....	.....	.....
	Second ,,	5,964	5,964	.....	.....	.....
October	First ,,	6,374	6,374	.....	.....	.....
	Second ,,	15,851	15,708	143	·90	.....
November	First ,,	12,382	12,269	113	·91	.....
	Second ,,	2,546	2,546	.....	.....	.....
December	First ,,	1,334	1,334	.....	.....	.....
	Second ,,	1,696	1,696	.....	.....	.....
January	First ,,	.....	.....	.....	.....	.....
	Second ,,	.....	.....	.....	.....	.....

(*b*)

Year and half month		Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,944 m.c.ft. on any day	Half-monthly totals of computed discharge, Agunda Cauvery, column 5 of table III, limited to 2,944 m.c.ft. on any day	Half-monthly diminution, column 2—column 3 ·625 ·33	Percentage of column 4 to column 2	
					·625 ·33	—
1		2	3	4	5	6
June	First half	2,382	2,382	.....	.....	.....
	Second ,,	5,270	5,270	.....	.....	.....
July	First ,,	26,079	20,252	5,827	22·34	.....
	Second ,,	41,400	39,441	1,959	4·73	.....
August	First ,,	44,160	44,160	.....	.....	.....
	Second ,,	28,314	27,966	348	1·23	.....
September	First ,,	17,757	17,757	.....	.....	.....
	Second ,,	5,964	5,964	.....	.....	.....
October	First ,,	6,374	6,374	.....	.....	.....
	Second ,,	15,548	15,405	143	·92	.....
November	First ,,	12,382	12,269	113	·91	.....
	Second ,,	2,546	2,546	.....	.....	.....
December	First ,,	1,334	1,334	.....	.....	.....
	Second ,,	1,696	1,696	.....	.....	.....
January	First ,,	.....	.....	.....	.....	.....
	Second ,,	.....	.....	.....	.....	.....

Ma. 25—C5—concld.

Year and month	(c) Half-monthly total of natural discharge, Agunda Cauvery, limited to 2,300 m.c. ft. on any day	(c) Half-monthly totals of computed discharge, Agunda Cauvery, column 5 of table III, limited to 2,300 m.c.ft. on any day	(c) Half-monthly diminution, column 2—column 3. ·625 ·33	(c) Percentage of column 4 to column 2 ·625 ·33	(c) Percentage of column 4 to column 2 —
1	2	3	4	5	6
June ... First half	2,382	2,382	.....	.....	.....
June ... Second ,, ...	5,270	5,270	.....	.....	.....
July ... First ,, ...	23,033	19,747	3,286	14·27	.....
July ... Second ,, ...	34,460	32,668	1,792	5·20	.....
August ... First ,, ...	34,500	34,500	.....	.....	.....
August ... Second ,, ...	27,440	27,422	18	·07	.....
September ... First ,, ...	17,757	17,757	.....	.....	.....
September ... Second ,, ...	5,964	5,964	.....	.....	.....
October ... First ,, ...	6,374	6,374	.....	.....	.....
October ... Second ,, ...	14,904	14,761	143	·96	.....
November ... First ,, ...	12,382	12,269	113	·91	.....
November ... Second ,, ...	2,546	2,546	.....	.....	.....
December ... First ,, ...	1,334	1,334	.....	.....	.....
December ... Second ,, ...	1,696	1,696	.....	.....	.....
January ... First ,, ...	.....	.....	.....	.....	.....
January ... Second ,, ...	.....	.....	.....	.....	.....

Year and month	(d) Half-monthly total of natural discharge, Agunda Cauvery, limited to 1,966 m.c.ft. on any day	(d) Half-monthly totals of computed discharge, Agunda Cauvery, column 5 of table III, limited to 1,966 m.c.ft. on any day	(d) Half-monthly diminution, column 2—column 3 ·625 ·33	(d) Percentage of column 4 to column 2 ·625 ·33	(d) Percentage of column 4 to column 2 —
1	2	3	4	5	6
June ... First half	2,382	2,382	.....	.....	.....
June ... Second ,, ...	5,270	5,270	.....	.....	.....
July ... First ,, ...	20,967	18,915	2,052	9·79	.....
July ... Second ,, ...	30,204	28,892	1,312	4·34	.....
August ... First ,, ...	29,490	29,490	.....	.....	.....
August ... Second ,, ...	26,444	26,426	18	·07	.....
September ... First ,, ...	17,757	17,757	.....	.....	.....
September ... Second ,, ...	5,964	5,964	.....	.....	.....
October ... First ,, ...	6,374	6,374	.....	.....	.....
October ... Second ,, ...	14,252	14,252	.....	.....	.....
November ... First ,, ...	12,233	12,150	83	·68	.....
November ... Second ,, ...	2,546	2,546	.....	.....	.....
December ... First ,, ...	1,334	1,334	.....	.....	.....
December ... Second ,, ...	1,696	1,696	.....	.....	.....
January ... First ,, ...	.....	.....	.....	.....	.....
January ... Second ,, ...	.....	.....	.....	.....	.....

Exhibit My. 22.

Reply to the Madras Note on 3rd issue (Ma. 24) including Examination of the Working Tables.

The award under issue 2 (*b*) was given in two alternative forms, *viz.*, a uniform limit flow of 22,750 cusecs or varying limits ranging from 2·5 to 6·7 feet on the Cauvery Dam in the different months according to the actual requirements. Madras have now elected the uniform limit as being the more advantageous to them. But they have recorded a protest even against such a uniform limit, which, it must be stated, results in a serious disadvantage to Mysore as regards impounding. Mysore have all along been urging that the requirements of the delta irrigation can be duly met by varying limits and that they should be fixed more or less in accordance with the provision made in the metur project. It was therefore to be expected that, in fixing the limits of flow above which impounding may be allowed in Mysore, due benefit would be given to them by prescribing suitable varying limits without an alternative being placed at the option of Madras.

2. Three systems of measurement have been discussed by Madras. The first of these may be called the Madras system, the second, the Mysore system and the third, the proportionate limit system. Madras have shown an inclination towards the third system and, in the course of their remarks, have stated that one of the merits of this system is "while the greatest part of the surplus waters would be impoundable by Mysore, still a small share of every flood would pass to Madras."

3. On the contrary, Mysore have repeatedly shown that this third system imposes the greatest restrictions on Mysore and the quantity of water available for impounding under this system is very much less than that due to them under the Agreement of 1892 and that it will result in allowing large quantities of the surplus being wasted into the sea without benefiting either party. Any system that may be approved must enable Mysore to impound as large a portion of this surplus as possible whenever it becomes available at their Reservoir site after conserving the prescriptive rights of Madras. Mysore have, as already stated, the first claim to get the full benefit of the surplus waters as far as can be impounded in their Reservoir.

4. The third issue clearly states that the principles and rules to be formulated for working the Kannambadi Reservoir should ensure to Madras full protection of *their prescriptive rights.* It is clear from this that no further restrictions whatever against impounding in Mysore are to be imposed merely with the idea of enabling Madras to get a share of the surplus waters over and above such prescriptive rights. Any attempt in this direction would be tantamount to raising the prescriptive limits already fixed in full consideration of the facts and figures and to laying an additional and unjustifiable burden on Mysore. Mysore wish to record their protest against any new claim that may now be put forward by Madras regarding the sharing of the surplus waters as contrasted with the protection of their prescriptive rights.

5. Under any system of impounding there is bound to be some surplus waters at the Cauvery Dam and while Madras may enjoy the benefit of such floods whenever they come, Mysore cannot accept any system of measurement put forward with an idea of securing to Madras a share of the surplus waters in addition to the conservation of their prescriptive rights. This would restrict the legitimate facilities for impounding in Mysore and such an additional burden would be contrary to the Agreement of 1892. This point has already been urged in paragraph 100, My. 9 and paragraphs 85 to 87 in My. 12 and Sir John Benton also has clearly expressed (Ma. 9, paragraph 32 (*i*) of his note, dated 12th May 1911) that "the Mysore Durbar are to have all the surplus supplies to which they have any claim under the existing agreement placed unconditionally at their disposal."

6. The only system of measurement that would ensure the legitimate claims of Mysore to the surplus waters after meeting the prescriptive rights of Madras is

that proposed by Mysore. Madras have generally accepted the principles on which this system is based and have never so far disputed the first claim of Mysore to the surplus waters, as far as can be impounded in their Reservoir.

7. Madras object to the Mysore system, not so much on the ground that the flow within the prescriptive limits would be interfered with, but on the ground that it would threaten the prospects and prosperity of the Lower Anicut system. No reservoir would be possible without interfering with the floods. Any objection to the Mysore system would only be tenable if it can be shown that the flow within the 6½ feet limit is materially interfered with and not when the surplus flow above that limit is affected. In this light the references made by Madras to the requirements of the Coleroon irrigation need not be further considered.

8. It is therefore urged that considerations about the *sharing* of the flood waters by Madras over and above the quantities representing their prescriptive rights should not be brought in, in judging about the relative merits of the several systems of measurement proposed and in finally adjudicating on the third issue.

9. For discussing the merits of the system of measurement at the four rivers proposed by Madras, it would be desirable to find out what proportion of the total flow at the Cauvery dam is contributed by these four rivers.

It has been estimated that the Bhavani contributes 20 per cent of the total flow at the Cauvery dam. The contribution coming from all the other tributaries between the four places of measurement and the Cauvery dam may safely be taken as about 10 per cent of the total. Thus the total contribution from the catchment below the four places would amount to 30 per cent of the total in the south-west monsoon. This means (100—30=) 70 per cent of the Cauvery dam discharge is the contribution at the four places named by Madras.

10. The Assessor has also computed that the yield at the Metur site for the two monsoons is 0·74 and 0·34 of that at the Cauvery dam, the corresponding figures for the yield at the Kannambadi reservoir being 0·48 and 0·14 respectively. Thus the three more important tributaries between the Kannambadi and the Metur Reservoir sites, namely, the Kabbini, the Shimsha and the Arkavati together contribute (74—48=) 26 per cent in the south-west monsoon and (34—14=) 20 per cent in the north-east monsoon.

11. From the map and the diagram prepared by the Assessor (Appendix-A E 7 and 8) the contribution from the Arkavati and Shimsha may be found out to be about one-fifth of the yield between the Kannambadi and the Metur sites noted above. Thus the net yield of the Kabbini would be about (four-fifths of 26 per cent or) 21 per cent and (four-fifths of 20 per cent or) 16 per cent, respectively, in the two monsoons Adding to these, the yield at Kannambadi, the combined proportions at the four anikats proposed by Madras would be (21+48=) 69 per cent and (16+14=) 30 per cent respectively for the two monsoons. This result agrees with the proportion of 70 per cent worked out in paragraph 9 above for the south-west monsoon.

12. While the proportionate contribution from the four places has thus been proved to be 0·70 and 0·30 of the flow at the Cauvery dam for the two monsoons, the demand of Madras, namely, that the full limit of flow at the Cauvery dam together with 25 per cent extra in the south-west monsoon should be reserved at these four places would mean in effect that this limited catchment area concerned contributes 125 per cent of the flow at the Cauvery dam instead of about 70 per cent only.

13. Further, Madras themselves have stated that they would accept the third system of measurement, if a proportion of 0·65 for the south-west monsoon were fixed for the Kannambadi catchment which excludes the Kabbini. It has been shown above that the Kabbini catchment contributes 21 per cent of the total or a fraction of $\frac{21}{48}$ of the Kannambadi yield. Accordingly, if Madras are willing to accept a proportion of 0·65 per cent at the three places, they would not be justified in demanding more than ($\cdot65+\frac{21}{48}\times\cdot65=$) ·93 of the total, if measurement is to be made at the four places of measurement suggested by Madras. Thus the demand by Madras according to the method proposed by them, that as much as 125 per cent of the total flow due at the Cauvery dam should be reserved at the four places, is wholly unjustifiable by actual calculation.

14. The principle upon which the Madras system is based obviously involves two untenable conditions. First, that the whole flow due at the Cauvery dam is to be reserved at the four places situated about 250 miles higher than the point where the quantity becomes due and, secondly, that an addition of 25 per cent extra is to be added in the south-west monsoon to make up for the transmission losses.

15. It has been clearly shown that the contribution at the four places during the south-west monsoon can only be taken as about 70 per cent of the flow at the Cauvery Dam. If therefore 1,966 million cubic feet per day is due at the Cauvery Dam, it would not be fair to demand more than 70 per cent of 1,966 = 1,376 m.c.ft. at the four places on the principle of the proportionate limit system. So, while the demand of Madras that the full quantity of 1,966 million cubic feet daily should be reserved at the four places would by itself be quite unfair, the further demand of 25 per cent for transmission losses in addition to the full quantity due at the Cauvery Dam would only add to the unreasonableness of the demand. Hence the first system as put forward by Madras cannot be considered as based on correct data and therefore cannot be accepted by any means.

16. But Madras state that either the first or the third system would safeguard their interests. If the principle of the third system is acceptable, the application of this principle to the measurement at the four places mentioned in the first system, should also be acceptable. Madras have shown their inclination to adopt the third system, because this would do away with the computation of compensation water. Mysore are willing to accept what is practically the Madras system if it is duly modified on the principle of the third or the proportionate limit system.

17. Accordingly, Mysore propose that, if the measurement is to be made at the four places on the principle of the third system, the proportions as below may be accepted and free impounding allowed above these limits:—

	Proportion	Limit
South-west monsoon	0·75 × 22,750 =	17,062 cusecs.
North-east monsoon	0·33 × 22,750 =	7,583 „

18. The combined system with the above proportions differs from the third system in as much as the large flow of the Kabbini forming an important tributary of the Cauvery in the province will be duly included. The very fact that Madras have included the Kabbini with the other three tributaries above the reservoir in their system of measurement clearly shows that the omission of this important tributary would impose undue restrictions against impounding in Mysore.

19. Thus, if the principle of the measurement at the four places is to be adopted, the only way this could be made agreeable to both the parties is by finding out what proportion of the total flow at the Cauvery Dam in the two monsoons is contributed at these four places and fixing limits of impounding by reducing the prescriptive limits in these proportions. Such proportions have been shown to be ·70 and ·30 for the two seasons and Mysore have now allowed ·75 and ·33 to err somewhat on the safe side.

20. The proportions now fixed will be found to be quite fair, considering that the question of transmission losses does not arise at all in the proportionate limit method now proposed to be applied for measurement at the four places—

(*a*) Supposing the flow at Kannambadi is 100 and the corresponding flow at the Cauvery Dam is 180, then the proportion that would be applicable to the third method is $\frac{100}{180}$.

In this the question of transmission losses is out of consideration as the calculated discharge at Cauvery Dam is after the losses due to evaporation, absorption, etc., on the way, have been allowed for.

If 25 per cent is the transmission loss, then 100 at the Kannambadi reservoir is only worth 75 at the Cauvery Dam and the real proportion would then be $\frac{75}{180}$ and not $\frac{100}{180}$.

If the transmision loss factor, *viz.*, $\frac{25}{180}$, is added to this factor $\frac{75}{180}$, then the proportion becomes $\frac{100}{180}$ which is the value of P in the third method by assumption.

Accordingly, the already larger value of P does not give scope to the consideration of the transmission losses.

If this is to be considered, the smaller proportion of $\frac{75}{180}$ has to be taken.

(*b*) This fact may also be proved in general terms.

Let K be the flow as measured at Kannambadi.

And C be the flow as measured at the Cauvery Dam.

By assumption P the proportion to be taken for the third method of measurement is evidently $\frac{K}{C}$ and the proportion ·48 (paragraph 37 of Assessor's note) between the two discharges has been arrived at by this method.

If t is the transmission loss percentage on the flow at Kannambadi, the value of K at the Cauvery Dam would be reduced to $K\frac{(100-t)}{100}$. Then the real proportion between the two discharges as measured at the same place, Cauvery Dam, after allowing for the transmission losses would be not

$$\frac{K}{C} \text{ but } K\frac{(100-t)}{100\,C} = \frac{K}{C}\frac{(100-t)}{100} = P\frac{(100-t)}{100} = P',$$

where P' is less than P in the proportion of $\frac{(100-t)}{100}$.

So, it is evident that when the higher conventional proportion P is taken as the basis of the third system of measurement, it already allows for the increase of the real proportion P' by the factor $\frac{100}{(100-t)}$ and so there is no scope for any addition due to the transmission losses.

If this loss t is to be added, then the smaller proportion $P' = \frac{100-t}{100} \times P$ has to be taken as the basis of the third system of measurement. It is therefore clear that no transmission losses are to be allowed for, if the larger proportion $\frac{K}{C}$ is taken as the basis for the third system or for the combined system based on the third system as now proposed.

21. It may be stated here in passing that when the flow at Kannambadi has been computed as 48 per cent of that at the Cauvery Dam, the above calculations show that there is no scope whatever to allow anything extra to cover transmission losses.

22. It may be stated that the high proportions of 0·625 and 0·30 for the Kannambadi catchment have been proposed by Mysore for their method of measurement, simply with the idea of eliminating the question of compensation water from consideration as well as on account of the greater facilities for impounding that would be secured by their method even with these higher proportions.

23. With these general remarks, the working tables may now be examined. Madras have worked out tables as under:—

—	Proportions		Table number
	South-west	North-east	
Mysore system	0·60	0·40	XI
Do	0·70	0·45	IX
Third system	0·60	0·4	XII
Do	·65	0·425	X

24. At the outset, it should be remarked that the proportionate factors for the north-east monsoon have been taken from 0·4 to 0·45 by Madras. A glance at statement A of My. 21 will show that the proportion does not at all exceed 0·30 except in two years. Also, the proportion as worked out by the Assessor is 0·14. It would therefore be quite out of all proportion to take the larger factor of 0·4 or more for the north-east monsoon. Mysore have taken the proportions of 0·25 and 0·30 for their working tables, on the ground that, out of 13 years for which records are available, the proportion does not exceed 0·25 in more than three years. At all events any factor above 0·30 would only apply to quite exceptional conditions and cannot be accepted.

25. As regards the proportion for the south-west monsoon, the high factor of 0·70 assumed by Madras is quite out of question, as the estimated flow at Kannambadi is only 0·48 of that at the Cauvery Dam and as it has been shown there is no scope for the inclusion of the transmission loss factor in the figure representing this

proportion. Mysore have already proposed that a fair factor to be assumed would be 0·55, which could be increased to 0·625 provided the claim for compensation water on their method of measurement is waived.

26. With these remarks, it is hardly necessary to make any comments on table IX worked out by Madras on the Mysore system with proportions of 0·70 and 0·45 for the two seasons. A glance at columns 12 and 13 of the abstract K will show that these high proportions produce a shortage in the reservoir irrigation supply below the normal in 10 out of 13 years, whereas, in one year the balance at the end of June (column 11) is a *minus* quantity, although this is partly due to the very heavy draw-off for power based on incorrect data, as separately shown. The total shortage in the 13 years comes to as much as 61,647 m.c.ft. This shows that very unnecessary restrictions have been placed on impounding in Mysore owing to the very high factors chosen.

27. In table XI, worked out by Madras on the Mysore system, the proportions assumed are 0·6 and 0·4 for the two monsoons. The results of this are abstracted in statement L. Considering that allowance for compensation has to be made with these factors, the results are more unfavourable than those of the table worked out by Mysore with the proportions of 0·55 and 0·25, (statement C, My. 21). In the latter case, in 8 out of 13 years, the Reservoir gets its full and normal supply and the total shortage is 27,542 m.c.ft. (column 12), whereas with the Madras proportions of 0·6 and 0·4, the normal supply is secured in only six years with a shortage of 35,733 m.c.ft. (column 13, statement L). Comparing the same table of Madras (statement L) with the Mysore table with proportions 0·625 and 0·30 (statement E), Mysore will get according to the latter its normal supply in eight years with a shortage of 30,895 m.c.ft. (column 12, statement E) against 35,733 m.c.ft. (column 13, statement L) by the Madras table, even with a more favourable proportion of 0·60. This is due to the fact that the proportion chosen by Madras for the north-east monsoon is abnormally high, as noted above.

28. Coming to the Madras tables (X and XII) on the proportionate limit system, it may be stated that, with the same factors, the shortage by this system during the 13 years would be practically double of that by the Mysore system. Comparing Madras table XI (statement L) and table XII (statement N) both worked out with the same proportions 0·6 and 0·4, it will be seen that the shortage by the Mysore method is only 35,733 m.c.ft. (column 13, statement L) extending over seven years, while that by the proportionate method is more than double of this quantity, being as much as 72,177 m.c.ft. (column 13, statement N) extending over 10 years. If, on the other hand, table X of Madras on the proportionate limit system with the proportions 0·65 and 0·425 (statement M) is compared with the Mysore table with proportions of 0·625 and 0·30 (My. 21, statement E) it will be seen that the shortage by the Mysore method is only about 30,895 m.c.ft. extending over five years (column 12, statement E), whereas it is as much as 81,400 m.c.ft. by the proportionate limit method and extends over 11 out of 13 years (column 13, statement M). This shows clearly that with the proportions of ·65 and ·425 proposed by Madras, the proportionate limit or third system would be disastrous to Mysore interests as it would mean shortage in the reservoir in 11 out of 13 years. Even the lower proportions of ·6 and ·4 cannot be accepted for the proportionate limit system on account of the heavy shortage noted above.

29. This also proves that to give the same results of impounding, the proportion factors for the third system will have to be much smaller than for the Mysore system. In fact, it has been proved (My. 21, App. V) by an algebraical equation that, to give the same benefit of impounding to Mysore with the same discharge at the Kannambadi reservoir, the factor for the proportionate method will have to be as low as 0·35 to correspond with the factor of 0·625 for the Mysore method. This is fully corroborated and exemplified by the working tables as indicated in the remarks under the preceding paragraph.

30. It may be noted that such undue restrictions against impounding in the Kannambadi reservoir arises from the fact that Mysore would, under the proportionate system, be obliged to pass down the natural flow of the river up to a certain limit every day at Kannambadi, even when the flow from the rest of the catchment is more than 22,750 cusecs at the Cauvery Dam. The combined discharge from the Kabbini, the Bhavani and the other lower tributaries may on many days be more

than sufficient to meet the Madras requirements and the proportionate limit system would impose even on such days, the passing of a flow up to the proportionate limit. It is this feature of the proportionate limit system that operates against legitimate impounding in Mysore.

31. One point that may be urged in favour of the proportionate limit system is that it eliminates the computation of compensation water for shortage in the resulting flow up to a limit of 6½ feet; but it will be seen from the statement P that this is not true. The statement shows in comparative form the percentage of compensation water on four sets of tables worked out as under for each of the thirteen years :—

System	Factors
Proportionate limit system	0·65 and ·425
Do	0·6 and 0·4
Mysore system	0·6 and 0·4
Do	0·625 and ·30

32. It will be observed that there would be some shortage in each year under both the systems whatever be the proportion factors adopted. This shows clearly, first, that the factors should not be unduly increased against Mysore, as even such an increase cannot from the nature of things do away with all shortage, however small, on the total natural flow at the Cauvery Dam limited to 1,966 m.c.ft. per day.

33. It will also be seen from the statement H (i) with proportions ·625 and ·30 as worked out by Mysore that, in 11 out of 13 years, the quantity of compensation water does not exceed 2 per cent of even the comparatively small flow limited to 6½ feet (1,966 m.c.ft.) on the Cauvery Dam, while the average comes to only 1·21 per cent (column 9, statement H-i). This is further reduced to 1·13 per cent (column 13) if the resulting flow is taken up to a limit of 2,300 m.c.ft. and to 1·08 per cent only (column 17) of the resulting flow up to 2,944 m.c.ft. limit. This is quite a negligible quantity and on all fair and reasonable considerations can be left out of account. This shows that no undue restrictions should be imposed against Mysore merely to avoid such negligible differences, as indeed they are inevitable under any system whether based on a proportionate limit or the Mysore system.

34. It may be stated that Madras have themselves stated in Ma. 24, paragraph 19, as follows:—

"The Government of Madras consider that if, in opposition to their contentions, this system is adopted, such proportions should be adopted as will reduce the compensation water with the resulting interference with flow and necessary errors in computation to a small total as regards both quantity and occasions when passing becomes necessary.

The proportions, south-west monsoon	·70
,, north-east ,, ...	·15

applied to this system are put forward as the smallest which can be said to fulfil this condition."

But even here (statement H-2) the average per cent of compensation water for the 13 years varies from 0·71 to 0·59 (columns 9, 13 and 17, statement H-2) against 1·21 to 1·08 (columns 9, 13 and 17, statement H-1) with the proportions of 0·625 and 0·30 proposed by Mysore. Thus the gain to Madras is only measured by a quantity lying between 0·50 per cent and 0·49 per cent, which, in all fairness, is quite negligible so far as Madras supply is concerned.

35. On the other hand, the effect on Mysore, comparing the same two tables, will be that the higher proportion of 0·70 and 0·45 proposed by Madras would more than double the shortage, the increase being from 30,895 m.c.ft. (column 12, statement E) to as much as 61,647 m.c.ft. (column 13, statement K). This means that the reservoir will lose on an average (30,752/13 m.c.ft) 2,366 m.c.ft. every year. Considering that the normal supply for irrigation is about 36,000 m.c.ft., the loss amounts to as much as 7 per cent of the normal supply every year. The deficiency in the Madras supplies is a negligible quantity and is besides made up in most cases by the abundant flow on the immediately succeeding days, while the loss to Mysore would be as much as 7 per cent, on an average, every year and cannot from the nature of things be made up.

36. The arguments in the preceding paragraphs may now be summarized:—

(*a*) Any system whatever would be acceptable to Mysore in so far as it may be based on the principle of conserving the prescriptive rights of Madras, as clearly defined in the third issue, provided that no extra burden is to be imposed upon Mysore by way of apportioning any share of the surplus waters to Madras. If the third or the proportionate limit system is sought to be introduced with this latter object, Mysore have to strongly object to any such extra burden being imposed, as it would be contrary to the Agreement of 1892.

(*b*) The Madras method of measurement at the four places above the reservoir has been duly examined and found to be unacceptable, because it altogether ignores the replenishment below these anikats, while imposing a further unwarranted burden of 25 per cent for the transmission losses. The only way in which the measurement at the four places proposed by Madras could be rendered acceptable to Mysore is by applying the principle of the proportionate limit or the third system and by fixing suitable factors for the contribution at the four anicuts, as compared with the total flow at the Cauvery Dam. These factors after due examination have been suggested to be 0·75 and 0·33 for the south-west and the north-east monsoons. It should be stated that the disadvantages of the third system do not altogether disappear by this combined system but are somewhat reduced on account of the inclusion of the Kabbini flow for arriving at the proportionate factors.

(*c*) The only system that secures to Mysore their legitimate rights to the surplus waters, as far as available at the reservoir site, after fulfilling the prescriptive rights of Madras, is that proposed by Mysore and this deserves acceptance on all fair and reasonable considerations.

(*d*) The working tables prepared by Madras have been examined. The proportions for the two monsoons assumed by Madras have been shown to be too high. Those adopted by Mysore, *viz.*, 0·55 and 0·25 for the two monsoons, with the computation of compensation water, and 0·625 and 0·30, without such compensation, have been shown to be fair to both parties, if the Mysore system of impounding is adopted.

(*e*) A material objection urged against the Mysore method is that it involves the computation of compensation water. But it has been shown that even the proportionate limit method does not eliminate the loss due to shortage below the limit flow at times, which may be called compensation water. It would not therefore be justifiable to unduly increase the proportions merely with the idea of avoiding the computation of compensation water.

(*f*) But Mysore have shown their willingness to adopt increased proportions of 0·625 and 0·30 with the idea of eliminating such computation. The loss to Madras by such omission has been shown to be inappreciable. Madras have stated that, if they have to submit to this method, they suggest that the factors of 0·70 and 0·45 should be adopted. The difference in the results with two sets of factors have been shown to be only about 0·50 per cent of the flow at the Cauvery Dam, whereas the loss to Mysore would be on an average as much as 7 per cent every year.

(*g*) Coming to the third system, it has been shown [*vide* paragraphs 20 and 21] that, when the proportion of the flow at the two places has been arrived at (0·48 in the present case), there is no scope for increasing this proportion on any consideration of transmission losses. By comparing the results of the third system for different sets of factors with those of the Mysore system, it has been shown that the shortage in the reservoir irrigation supply would be 2 to 3 times that arising from the Mysore method. This confirms the calculations that, to give the same facilities for impounding with the third system, very much smaller factors should be adopted than for the Mysore system. In fact, this proportionate system, as already stated, would greatly curtail impounding and cannot therefore be accepted.

37. In conclusion, Mysore urge that one of the three alternatives noted below may be finally accepted:—

(i) Mysore system with the proportions of 0·55 and 0·25 with the computation of compensation water.

(ii) Mysore system with the proportions of 0·625 and 0·30 without computation of compensation water.

(iii) Measurement at the four places suggested by Madras, but on the principle of the proportionate limit method with the factors of 0·75 and 0·33 for the two monsoons.

KARPUR SHRINIVASRAV,
Mysore Representative.

31st March 1914.

Exhibit My. 22-a.

Note on sample table showing the advantage of the combined system, or the third system, including the Kabbani, over the third system applied to Kannambadi catchment only.

Mysore have always objected to the Madras system on the ground that the replenishment below the four places of measurement is left out of account, while an extra 25 per cent is added without any justification. If the contribution from the four tributaries is correctly estimated, it will be found that it amounts to about 70 per cent of the total at the Upper Anicut. If this proportion or something near it is adopted and not (100+25)=125 per cent. Mysore would not have so much objection against even the proportionate system of measurement, as applied to the four rivers including the Kabbani.

2. To exemplify the difference between the proportionate limit system as applied to Kannambadi catchment, on the one hand, and to the somewhat larger catchment above Kannambadi and the Kabbani, on the other, a sample table has been worked out for a few days.

3. Here, the proportion of ·48 has been taken for the Kannambadi discharge and ·75 for that including the Kabbani, and the corresponding limits beyond which impounding is permissible, would. therefore be ·48 × 1,966 =944 m.c.ft., in the former case and ·75×1,966 =1474 m.c.ft., in the latter including the Kabbani. This means that, whenever the Kabbani flow is more than (1,474—944)=530 m.c.ft., the impounding at Kannambadi may be increased up to this excess quantity.

4. From the table, it is clear that the proportionate system as applied to Kannambadi catchment gives 16,964 m.c.ft., for storage, against 22,258 m.c.ft., when the Kabbani is included. Thus Mysore will be deprived of a storage of (22,258 — 16,904)=5,354 m.c.ft., on the 12 days on which impounding is shown in the sample table.

5. The reason for this difference may be explained as below:—

(i) From columns 5 and 7 it will be seen that on days 1 to 4 the Kabbani discharge alone is more than the combined limit for the four rivers, *viz.*, 1,474 m.c.ft., the whole of the Kannambadi discharge would be available for storage on these days; whereas by confining the proportionate limit to the Kannambadi alone, 944 m.c.ft. on each of these four days would not be available for storage amounting to a loss of 944×4=3,776 m.c.ft., as shown in column 10.

(ii) Even on the days on which the Kabbani discharge is less than the combined limit of 1,474 m.c.ft. some credit from the Kabbani area would be due at Kannambadi on all the days when the Kabbani discharge is greater than (1,474—944)= 530 m.c.ft. Thus the extra quantities available for storage from the Kabbani river alone, are shown in column 10 and this adds to the Kannambadi storage by 1,400 m.c.ft. Hence the storage with the combined system would be as shown in column 9, which, on each of the five days (5 to 9), exceeds the Kannambadi storage (column 4) by the quantities shown in column 10. This is another advantage in the combined system.

(iii) On the days on which the Kannambadi discharge is less than 944 m.c.ft., no storage would be possible. But, on some of these days, the Kabbani discharge may be more than 530 m.c.ft., (from 10 to 12 days) and this excess (column 10) when added to the Kannambadi discharge may make it exceed 944 m.c.ft., and so there can be some storage at Kannambadi, as shown in column 9.

6. But there may be days (13th and 14th) when the excess of the Kabbani flow over 530 m.c.ft., may not make up the deficit in the Kannambadi flow

and on such days there will be no storage. There will also be no storage when the Kabbani discharge is less than 530 m.c.ft. and the Kannambadi discharge less than 944 m.c.ft., as on the 15th to the 18th in the statement.

KARPUR SHRINIVASRAV,
Mysore Representative.

1st April 1914.

Enclosure.

Number	Third system for three rivers above Kannambadi-proportion 0·48			Combined system on the proportionate limit applied to four rivers (*i.e.*) including Kabbani-proportion 0·75						.....
	Kannambadi discharge	Proportionate limit for Kannambadi	Excess of column 2 over column 3 available for storage	Kabbani discharge	Combined discharge of Kannambadi and Kabbani	Combined limit for Kannambadi and Kabbani		Excess of column 6 over column 7 permissible for storage	Storage limit to Kannambadi discharge	The advantage to the Kannambadi by the Kabbani	
1	2	3	4	5	6	7		8	9	10	
1	5,000	1,966	4,056	2,400	7,400	1,966		5,926	5,000	944	I
2	4,400	×	3,456	2,200	6,800	×0·75		5,126	4,400	944	
3	4,200	0·48	3,256	1,900	6,100	...		4,626	4,200	944	
4	3,100	=944	2,156	1,500	4,600	=1,474		3,126	3,100	944	3,776
5	2,800	944	1,856	1,200	4,000	944	530	2,526	2,526	670	II
6	2,000	...	1,056	900	2,900	...	...	1,426	1,426	370	
7	1,600	...	656	800	2,400	...	...	926	926	270	
8	1,300	...	356	600	1,900	...	...	426	426	70	
9	1,000	...	56	550	1,550	...	...	76	76	20	1,400
10	900	944	...	600	1,500	944	530	26	26	70	III
11	850	...	...	700	1,550	...	...	76	76	170	
12	800	...	...	750	1,550	...	...	76	76	220	460
13	700	944	...	600	1,300	944	530	...	...	...	...
14	650	...	...	550	1,200	...	...	...	...	...	...
15	600	...	...	500	1,100	...	...	...	...	...	...
16	400	...	...	400	800	...	...	...	...	...	...
17	450	...	...	350	800	...	...	...	...	...	...
18	500	...	...	300	800	...	...	...	...	...	...
	...	...	16,904	..	...	...	...	...	22,258	...	...

My. 22₁.

TABLE III.] **Statement H.—(1).** [PROPORTION 1·6 AND 3⅛.

Showing percentages of compensation water due on resulting flow up to different limits.

Years	Compensation water due		Total resulting flow		Resulting flow up to limit 1,966				Resulting flow up to limit 2,300				Resulting flow up to limit 2,944				Natural flow up to limit 1,966	Percentage of column 3 on column 18.
					Number of days above 1,966				Number of days above 2,300				Number of days above 2,944					
	Number of days	Quantity	Quantity	Percentage	Before impounding.	After impounding.	Quantity	Percentage	Before impounding.	After impounding.	Quantity	Percentage	Before impounding.	After impounding.	Quantity	Percentage		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1896–97 ...	7	2,595	650,010	·39	86	83	290,810	0·89	71	70	316,895	·82	60	57	357,758	·72	291,434	·89
1897–98 ...	1	706	595,489	·12	95	94	273,463	0·26	82	80	305,073	·23	66	63	348,415	·20	274,169	·25
1898–99 ...	8	3,261	422,177	·77	78	76	301,702	1·09	62	52	323,665	1·01	45	35	350,078	·94	303,288	1·07
1899–00 ...	3	910	185,727	·49	30	30	151,086	0·61	24	24	159,227	·57	17	15	170,614	·53	151,560	·66
1900–01 ...	7	3,839	615,261	·63	76	73	248,339	1·56	71	67	274,293	1·41	60	56	314,361	1·23	249,432	1·54
1901–02 ...	14	2,997	407,416	·74	83	75	285,822	1·05	70	62	305,829	·98	56	49	341,878	·87	286,394	1·04
1902–03 ...	16	5,743	371,817	1·55	67	59	263,444	2·21	59	44	281,983	2·06	36	30	305,402	1·91	264,824	2·16
1903–04 ...	4	1,184	667,489	·17	107	107	330,718	0·36	94	93	363,977	·32	79	75	420,178	·28	330,901	·35
1904–05 ...	7	4,462	315,604	1·43	58	58	200,256	2·27	53	51	218,500	2·08	40	38	248,012	1·83	200,523	2·22
1905–06 ...	7	2,498	210,711	1·19	38	32	177,451	1·42	31	19	185,921	1·35	23	12	195,856	1·28	178,696	1·40
1906–07 ...	6	3,618	337,290	1·07	62	62	219,039	1·66	55	56	238,490	1·52	46	44	271,779	1·34	219,509	1·65
1907–08 ...	7	3,016	405,828	·75	64	58	231,653	1·32	60	51	244,893	1·26	50	45	280,889	1·09	231,653	1·31
1908 ...	9	3,385	281,403	1·21	45	42	180,754	1·86	35	31	193,650	1·74	31	26	212,437	1·59	182,352	1·85
Total ...	...	38,246	5,466,222	·70	...	...	3,154,537	1·21	...	...	3,412,396	1·13	...	...	3,817,649	1·08	3,168,635	1·20

Showing percentages of compensation water due on resulting flow up to different limits.

Years	Compensation water due		Total resulting flow		Resulting flow up to limit 1,966				Resulting flow up to limit 2,300				Resulting flow up to limit 2,944				Natural flow up to limit 1,966		Percentage of column 3 on column 18
					Number of days above 1,966				Number of days above 2,300				Number of days above 2,944						
	Number of days	Quantity	Quantity	Percentage	Before impounding	After impounding	Quantity	Percentage	Before impounding	After impounding	Quantity	Percentage	Before impounding	After impounding	Quantity	Percentage			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1896 97 ...	3	736	648,483	·11	86	81	291,434	·26	71	70	317,637	·23	60	58	356,928	·21	291,434	·22	
1897-98 ...	2	593	598,442	·09	95	94	273,761	·21	82	81	303,342	·19	66	63	319,298	·17	274,169	·22	
1898 99 ...	9	5,462	425,617	1·28	78	72	300,132	1·83	62	55	321,851	1·71	45	36	350,145	1·57	303,288	1·80	
1899-00 ...	2	295	185,467	·16	30	30	151,560	·19	24	24	160,879	·18	17	14	173,216	·17	151,560	·19	
1900 01 ...	3	1,539	606,106	·25	76	75	248,669	·62	71	68	272,612	·57	60	59	301,113	·51	249,432	·61	
1901-02 ..	6	992	404,204	·24	83	79	286,301	·35	70	61	309,657	·32	56	45	342,883	·29	286,391	·34	
1902-03 ...	10	2,951	372,713	·79	67	62	261,969	1·12	59	49	280,911	1·01	36	29	301,552	·96	261,824	1·11	
1903 04 ...	2	493	633,354	·08	107	106	330,901	·15	94	92	363,831	·13	79	74	416,419	·11	330,901	·14	
1904 05 ...	5	2,486	314,718	·80	58	57	200,523	1·27	53	52	218,710	1·16	40	40	248,212	1·02	200,523	1·23	
1905 06 ...	3	1,673	214,999	·78	38	35	177,435	·94	31	24	187,811	·89	23	14	198,878	·83	178,696	·93	
1906 07 ...	2	3,317	336,058	·99	62	63	219,236	1·52	55	55	238,948	1·40	46	41	271,395	1·23	219,809	1·06	
1907-08 ...	3	420	407,611	·10	64	62	231,653	·18	60	57	251,450	·16	50	44	283,940	·14	231,653	·18	
1908 ...	5	1,541	279,877	·55	45	43	181,731	·85	35	34	191,573	·79	31	27	214,055	·72	182,352	·84	
Total ...	...	22,528	...	·41	...	...	3,155,308	·71	...	...	3,422,242	·65	...	...	3,814,094	·59	...	...	

My. 223.

MADRAS TABLE IX.] **Statement K.** [PROPORTION ·7 AND ·45.

Mysore system.

Year	Balance on 1st June	Quantity actually stored in the irrigation season up to January	Quantity stored from February to May	Total of columns 2, 3, and 4	Expenditure					Balance	Case	Shortage in the irrigation supply	Surplus
					Irrigation	Extra draw-off for tail tanks	Evaporation	Power	Total, columns 6, 7, 8 and 9				
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1896-97	4,000	52,312	981	57,293	31,936	5,712	3,913	7,875	49,166	7,827	C	3,687	1,86,591
1897-98	7,827	50,072	632	58,531	31,160	2,883	4,125	7,812	49,010	9,521	B	2,123	98,135
1898-99	8,767	46,557	2,777	58,101	32,479	...	3,922	8,335	44,736	13,365	H	3,801	...
1899-00	13,225	27,102	1,274	41,601	25,158	...	2,622	13,840	41,620	—19	H	11,125	..
1900-01	...	51,912	504	50,649	30,229	2,912	3,513	12,933	49,025	2,887	C	6,051	1,08,953
1901-02	2,829	60,726	827	61,382	36,229	2,565	4,191	4,277	47,162	17,220	A	54	30,281
1902-03	17,241	51,361	2,823	71,128	36,285	1,491	4,732	6,608	49,116	22,312	A	...	44,797
1903-04	22,246	46,681	1,571	73,501	35,344	1,010	4,961	1,121	45,439	28,065	A	1,037	97,391
1904-05	27,191	21,023	2,321	50,538	27,774	2,352	3,967	5,582	39,675	10,863	H and F	8,509	63,165
1905-06	10,877	31,207	96	45,180	26,881	...	3,451	9,348	39,680	5,500	E	9,102	...
1906-07	5,401	48,472	796	49,268	27,601	1,578	3,661	4,201	37,041	12,224	B	8,679	29,010
1907-08	12,224	42,334	1,997	56,555	32,610	3,820	3,979	4,552	44,971	11,564	C	3,643	1,32,812
1908	11,722	38,122	...	49,844	25,329	2,308	2,172	1,300	31,109	18,735	E	3,530	66,018

N.B.—1. Normal irrigation requirement is 36,283.
2. In 1908 irrigation requirement is 28,859 to end of December.
3. In 1896 irrigation requirement is 35,623 excepting first half of June.
4. Tables are worked from 16th June 1896 to end of December 1908.

MADRAS TABLE XI.]

Statement L.

Mysore System.

[PROPORTION. ·6 AND ·4.

Year	Balance on 1st June	Quantity actually stored in the Irrigation season up to January	Quantity stored from February to May	Total columns 2, 3 and 4	Expenditure					Balance	Case	Shortage in the Irrigation Supply	Surplus
					Irrigation	Extra draw-off for tail tanks	Evaporation	Power	Total of columns 6, 7, 8 and 9				
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1896—97	4,000	51,642	970	56,612	33,500	4,000	3,928	7,888	49,316	7,296	B	2,123	2,07,753
1897—98	7,305	52,738	632	60,675	36,283	3,169	4,215	7,864	51,535	9,140	A	...	1,06,673
1898—99	9,147	51,088	2,777	65,982	36,283	781	4,391	8,372	49,830	16,152	A	...	6,224
1899—00	16,131	27,959	1,274	45,364	27,670	672	2,879	14,197	45,418	—54	F	8,613	4,480
1900—01	—190	53,615	501	54,119	30,491	3,811	3,541	12,933	50,779	3,340	C	5,792	1,21,900
1901—02	3,340	62,467	1,005	66,760	36,136	4,112	4,431	4,208	48,887	17,873	A	147	43,431
1902—03	17,830	51,279	2,895	72,001	36,283	2,022	4,836	6,631	49,773	22,231	A	...	53,286
1903—04	22,246	46,700	4,816	73,792	36,327	4,000	5,080	1,124	46,531	27,261	A	...	1,11,248
1904—05	27,261	23,808	2,333	53,402	28,809	3,360	4,121	5,765	42,058	11,344	E	7,474	73,171
1905—06	11,272	39,097	96	50,465	31,577	...	3,782	9,359	44,718	5,747	C	4,706	...
1906—07	5,747	50,621	796	57,164	34,960	1,904	3,807	5,803	46,474	10,690	A	1,823	36,585
1907—08	10,796	35,736	2,106	48,638	31,214	4,000	4,010	4,719	46,943	11,695	B	2,069	1,41,363
1908	11,685	38,488	...	50,173	25,329	2,461	2,188	1,311	31,292	18,881	E	3,186	70,967
Total ...	...	...	...	...	...	...	...	...	...	...		35,733	9,77,086

N.B.—1. Normal irrigation requirement is 36,283.
2. In 1908 the irrigation requirement is 28,859 to end of December.
3. In 1896 the irrigation requirement is 35,623 excepting first half of June.
4. Tables are worked from 16th June 1896 to end of December 1908.

My. 22₅.

MADRAS TABLE X—PROPORTIONATE LIMIT SYSTEM.] **Statement M.** [PROPORTION ·65 AND ·425.

Year	Balance on 1st June	Quantity actually stored in the Irrigation season up to January	Quantity stored from February to May	Total of columns 2, 3 and 4	Expenditure					Balance	Case	Shortage in irrigation supply	Surplus		Remarks
					Irrigation	Extra draw-off for tail tanks	Evaporation	Power	Total of columns 6, 7, 8 and 9						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1896—97 ...	4,000	49,575	970	54,545	31,810	4,000	3,800	7,778	47,418	7,127	C	3,783	1,30,237	370	
1897—98 ...	7,127	47,806	632	55,565	34,160	2,084	3,987	7,857	48,088	7,477	B	2,123	86,711	678	
1898—99 ...	7,477	34,706	2,777	44,960	25,323	...	3,010	8,356	36,719	8,241	H	10,960	...	1,295	
1899—00 ...	8,241	17,166	...	25,407	20,397	...	1,133	3,177	24,707	700*	H	15,886	...	...	The reservoir fails in November and the table has been worked to end of November and the balance comes to 2,000. The balance 700 shown is due even in June.
1900—01 ...	...	49,218	504	49,722	27,953	2,016	3,438	12,787	46,194	3,528	B*	8,330	7,099	...	Case B wrongly applied.
1901—02 ...	3,531	51,138	1,004	55,673	31,763	1,991	4,187	4,228	42,169	13,504	B*	4,520	8,026	...	Irrigation begins from 4th July.
1902—03 ...	13,501	51,461	2,896	67,858	36,283	1,053	4,548	6,570	48,454	19,401	A	...	24,128	814	Surplussed in November.
1903—04 ...	19,404	47,617	4,824	71,845	36,327	2,464	4,940	1,124	44,855	26,990	A	...	57,637	...	
1904—05 ...	26,993	21,700	2,335	51,028	29,011	1,456	4,032	5,605	40,134	10,894	E	7,242	40,043	...	
1905—06 ...	10,897	23,737	83	34,717	24,603	...	2,363	7,762	34,728	—11	H	11,680	...	...	
1906—07 ...	...	46,574	701	47,275	26,574	1,120	3,778	4,185	35,657	11,618	B	9,709	11,643	...	
1907—08 ...	11,617	43,386	2,105	57,108	32,610	3,808	3,948	4,719	45,115	11,993*	C	3,643	89,364	886	*Difference is due to the 422 m.c.ft. omitted to be taken on 30th June.
1908 ...	11,571	37,955	...	49,526	25,329	1,942	2,156	1,311	30,738	18,788	D	3,530	..	...	
Total ...	...	...	...	...	...	...	...	...	...	...	...	81,406	3,76,978	...	

N.B.—1. Normal irrigation requirement is 36,283.
2. In 1908, irrigation requirement is 28,859 to end of December.
3. In 1896, irrigation requirement is 35,623 excepting first half of June.
4. Tables are worked from 16th June 1896 to end of December 1908.

Exh

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Statement showing percentages of quantity lost by Madras under differe

Month	1896-97				1897-98				1898-99				1899-00				1900-01				1901-02			
	Proportionate system		Madras	Mysore	Proportionate system		Madras	Mysore	Proportionate system		Madras	Mysore	Proportionate system		Madras	Mysore	Proportionate system		Madras	Mysore	Proportionate system		Madras	Mysore
	·65 and ·425	·6 and ·4	·6 and ·4	·625 and ·3	·65 and ·425	·6 and ·4	·6 and ·4	·625 and ·3	·65 and ·425	·6 and ·4	·6 and ·4	·625 and ·3	·65 and ·425	·6 and ·4	·6 and ·4	·625 and ·3	·65 and ·425	·6 and ·4	·6 and ·4	·625 and ·3	·65 and 425	6 and ·4	·6 and ·4	·625 and ·3
	1	2	3	4	1	2	3	1	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
June	...	...	...	...	·79	...	2·75	2·45	...	...	...	...	·59	·85	2·29	1·98	1·62	1·88	7·58	7·30	...	...	2·64	2·13
July	...	·14	·27	·07	...	1·01	·10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
August ...	...	...	...	...	...	...	...	...	1·49	2·19	4·16	4·29	·71	1·54	3·20	2·46	·30	·11	·51	·24	·72	1·58	2·37	1·43
September ...	...	...	...	1·29	...	...	...	...	·65	·82	3·51	2·81	...	...	...	...	...	...	...	...	...	...	...	...
South-west monsoon	...	·04	·08	·33	·11	·15	·43	·37	·63	.89	2·29	1·99	·21	·38	·90	·73	·29	·36	1·09	·97	·24	·53	1·18	·81
October ...	...	·02	1·10	0·91	...	...	·37	...	2·95	3·01	·95	·44	·28	...	...	...	...	·54	1·73	5·83	...	...	·62	·21
November ...	.94	1·25	4·41	6·72	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	·66	·93	2·27	3·50	
December ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
January ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
North-east monsoon	·22	·30	1·57	1·93	...	...	·22	...	1·10	1·13	·36	·16	...	...	...	...	·16	·30	·97	3·29	·23	·33	1·07	1·34
Total for the year...	·07	13	·61	·89	·08	·11	·37	·25	·87	1·01	1·32	1·07	·17	·31	·73	·60	·26	·34	1·06	1·53	·24	·45	1·13	1·05

Note.—For each year the percentages
Column 1 } Third system or proporti
" 2 }
" 3 } Mysore system as worked
" 4 }

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Exh

Sta

Statement showing percentages of quantity lost by Madras under differe

Month	1896-97				1897-98				1898-99				1899-00				1900-01				1901-02			
	Proportionate system		Madras	Mysore	Proportionate system		Madras	Mysore	Proportionate system		Madras	Mysore	Proportionate system		Madras	Mysore	Proportionate system		Madras	Mysore	Proportionate system		Madras	Mysore
	·65 and ·425	·6 and ·4	·6 and ·4	·625 and ·3	·65 and ·425	·6 and ·4	·6 and ·4	·625 and ·3	·65 and ·425	·6 and ·4	·6 and ·4	·625 and ·3	·65 and ·425	·6 and ·4	·6 and ·4	·625 and ·3	·65 and ·425	6· and ·4	·6 and ·4	·625 and ·3	·65 and 425	·6 and ·4	·6 and ·4	·625 and ·3
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
June	...	...	...	...	·79	...	2·75	2·45	...	...	...	...	·59	·85	2·29	1·98	1·62	1·88	7·58	7·30	...	...	2.64	2·43
July	...	·14	·27	·07	...	1·04	·10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
August ...	...	...	...	...	...	...	...	...	1·49	2·19	4·16	4·29	·71	1·54	3·20	2·46	·30	·41	·51	·24	·72	1·58	2·37	1·43
September ...	...	...	...	1·29	...	...	...	...	·65	·82	3·51	2·84	...	...	...	...	...	...	...	...	...	...	...	...
South-west monsoon	...	·04	·08	·33	·11	·15	·43	·37	·63	.89	2·29	1·99	·21	·38	·90	·73	·29	·36	1·09	·97	·24	·53	1·18	·84
October ...	...	·02	1·40	0·91	...	...	·37	...	2·95	3·01	·95	·44	·28	...	...	...	...	·54	1·73	5·83	...	...	·62	·24
November ...	.94	1·25	4·41	6·72	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	·66	·93	2·27	3·50
December ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
January ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...
North-east monsoon	·22	·30	1·57	1·93	...	...	·22	...	1·10	1·13	·36	·16	...	...	...	...	·16	·30	·97	3·29	·23	·33	1·07	1·34
Total for the year...	·07	13	·61	·89	·08	·11	·37	·25	·87	1·01	1·32	1·07	·17	·31	·73	·60	·26	·34	1·06	1·53	·24	·45	1·13	1·05

Note.—For each year the percentages
Column 1 } Third system or proporti
,, 2 }
,, 3 } Mysore system as worked
,, 4 }

MADRAS TABLE XII—PROPORTIONATE LIMIT SYSTEM.] **Statement N.** [PROPORTIONS '6 AND '4.

Year	Balance, 1st June	Quantity actually stored in the irrigation season up to January	Quantity stored from February to May	Total of columns 2, 3 and 4	Expenditure					Balance	Case	Storage in irrigation supply	Surplus
					Irrigation	Extra draw-off for tail tanks	Evaporation	Power	Total of columns 6, 7, 8 and 9				
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1896—97	4,000	50,202	970	55,172	31,936	4,000	3,927	7,891	47,754	7,418	C	3,687	136,319
1897—98	7,433	48,492	632	56,557	34,160	2,409	4,093	7,839	48,501	8,056	B	2,123	64,717
1898—99	8,312	37,987	2,777	49,076	25,323	...	3,481	8,389	37,184	11,892	H	10,960	...
1899—00	11,897	18,958	1,274	32,129	22,695	...	1,789	7,798	32,282	—153	H	13,588	...
1900—01	...	49,978	501	50,482	26,895	2,128	3,619	12,933	45,575	4,907	B	9,388	75,519
1901—02	5,082	53,821	818	59,671	36,285	2,629	4,142	4,228	47,282	12,389	A	Nil.	10,781
1902—03	13,399	52,611	2,895	68,905	36,283	1,232	4,522	6,634	48,671	20,234	A	,,	26,814
1903—04	20,171	47,371	4,835	72,377	36,327	2,715	4,955	1,124	45,121	27,256	A	,,	60,135
1904—05	27,264	23,352	2,333	52,949	30,841	1,568	4,230	5,605	42,244	10,705	D	5,442	42,792
1905—06	10,705	25,832	96	36,633	26,260	...	2,460	7,842	36,562	71	H	10,023	...
1906—07	...	47,270	130	47,400	28,490	1,250	3,786	4,201	35,727	11,673	B	9,793	14,240
1907—08	11,690	43,487	2,106	57,283	32,640	3,808	3,948	4,719	45,115	12,168	C	3,643	31,750
1908	12,168	37,597	...	49,765	25,329	2,016	2,172	1,338	30,855	18,910	E	3,530	41,260

N.B.—1. Normal irrigation requirement is 36,283.
2. In 1908 irrigation requirement is 28,859 to end of December.
3. In 1896 irrigation requirement is 35,623 excepting first half of June.
4. The tables are worked from 16th June 1896 to end of December 1908.

Exhibit My. 22.

Statement P.

Statement showing percentages of quantity lost by Madras under different methods examined on the natural flow up to limit 1,966 million cubic feet.

Month	1896-97				1897-98				1898-99				1899-00				1900-01				1901-02				1902-03				1903-04				1904-05				1905-06				1906-07				1907-08				1908			
	Proportionate system		Madras	Mysore	Proportionate system		Madras	Mysore	Proportionate system		Madras	Mysore	Proportionate system		Madras	Mysore	Proportionate system		Madras	Mysore	Proportionate system		Madras	Mysore	Proportionate system		Madras	Mysore	Proportionate system		Madras	Mysore	Proportionate system		Madras	Mysore	Proportionate system		Madras	Mysore	Proportionate system		Madras	Mysore	Proportionate system		Madras	Mysore	Proportionate system		Madras	Mysore
	·65 and ·925	·6 and ·4	·6 and ·4	·625 and ·3	·65 and ·925	·6 and ·4	·6 and ·4	·625 and ·3	·65 and ·925	·6 and ·4	·6 and ·4	·625 and ·3	·65 and ·925	·6 and ·4	·6 and ·4	·625 and ·3	·65 and ·925	·6 and ·4	·6 and ·4	·625 and ·3	·65 and 925	·6 and ·4	·6 and ·4	·625 and ·3	·65 and ·925	·6 and ·4	·6 and ·4	·625 and ·3	·65 and ·925	·6 and ·4	·6 and ·4	·625 and ·3	·65 and ·925	·6 and ·4	·6 and ·4	·625 and ·3	·65 and ·925	·6 and ·4	·6 and ·4	·625 and ·3	·65 and ·925	·6 and ·4	·6 and ·4	·625 and ·3	·65 and ·925	·6 and ·4	·6 and ·4	·625 and ·3	·65 and ·925	·6 and ·4	·6 and ·4	·625 and ·3
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
June ...	...	...	...	...	...	...	...	...	...	...	...	...	·59	·85	2·29	1·98	1·62	1·88	7·58	7·30	...	...	2·64	2·43	·60	1·10	2·95	6·93	...	...	...	...	...	...	...	...	·95	1·78	6·8	5·01	31·19	38·36	67·32	...	65·12	...	·12	61	...	62	1·10	1·26	7·72	6·12
July ...	...	·14	·27	·07	...	1·01	2·75	2·15	...	2·19	1·16	...	·71	1·54	3·20	2·46	·30	·11	·51	·24	...	1·58	2·37	1·43	...	1·62	7·72	·10	...	·06	·15	·08	...	4·80	10·74	8·28	·35	·63	1·62	1·04	...	·01	·51	0·26	...	...	1·05	2·21	...	1·14	11	·03
August ...	...	...	...	1·29	...	·65	·82	3·51	...	2·81	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1·52	·34	4·67	...	...	...	...	3·68	...	18	·12	·11	·07	·12	...	...	...	...	...	...	...	...	...	...	...	...
September ...	...	...	...	...	...	...	...	...	·29	...	·21	·38	·90	·73	·29	·95	1·09	·97	·24	·53	1·18	·84	·72	1·20	1·14	3·57	...	·02	·08	...	·43	·57	1·33	1·10	·35	·63	2·89	2·18	1·47	1·53	2·89	2·65	...	0·01	·47	·54	11	·74	2·91	2·18
South-west monsoon	...	·01	·08	·33	·11	·15	·43	·37	·63	·89	2·29	1·99	·21	·38	·90	·73	·29	·95	1·09	·97	·24	·53	1·18	·84	·72	1·20	1·14	3·57	...	·02	·08	...	·43	·57	1·33	1·10	·35	·63	2·89	2·18	1·47	1·53	2·89	2·65	...	0·01	·47	·54	11	·74	2·91	2·18
October ...	...	·02	1·10	0·91	...	...	...	...	2·95	3·01	·95	·44	·28	...	...	...	...	·54	1·73	5·83	...	·66	·93	·62	...	...	·14	·67	·01	·07	·24	1·9	3·12	3·49	8·31	12·35	...	...	...	·93	...	...	...	...	...	...	...	1·63	...	...	...	·40
November ...	·94	1·25	4·11	6·72	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2·27	3·50	...	·21	·77	1·85	·42	·52	·26	·22	...	...	...	...	...	...	...	6·85	...	...	...	·83	1·15	3·87	6·85	...	...	...	...
December ...	...	...	...	...	...	...	·37	...	2·95	3·01	·95	·44	·28	...	...	...	...	·54	1·73	5·83	...	·66	·93	·62	...	...	·14	·67	·01	·07	·24	1·9	3·12	3·49	8·31	12·35	...	...	...	·93	...	...	...	...	...	...	...	1·63	...	...	...	·40
January ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2·27	3·50	...	·21	·77	1·85	·42	·52	·26	·22	...	...	...	...	...	...	...	6·85	...	...	...	·83	1·15	3·87	6·85	...	...	...	...
North-east monsoon	·22	·30	1·57	1·93	...	...	·22	...	1·10	1·13	·36	·16	...	...	...	...	·16	·30	·97	3·29	·21	·33	1·07	1·34	...	·07	·26	·73	·10	·02	·14	·74	2·29	2·55	6·11	9·01	...	...	...	·61	...	...	...	...	...	...	...	...	...	...	...	·05
Total for the year..	·07	13	·61	·89	·08	·11	·37	·25	·87	1·01	1·32	1·07	·17	·31	·73	·60	·26	·31	1·06	1·53	·21	·45	1·13	1·05	·36	·62	2·28	2·99	·01	·08	·11	·36	·70	·85	2·00	2·22	·25	·15	1·49	1·16	·85	1·00	1·82	1·72	·07	·12	·69	1·31	·32	·58	2·28	1·91

Note.—For each year the percentages shown are in—
Column 1 ; Third system or proportionate limit system.
" 2 ;
" 3 ;
" 4 ; Mysore system as worked by Madras and Mysore, respectively.

Exhibit My. 23.

Mysore Rejoinder to the Madras Note on third issue, dated the 31st March 1914 (Ma. 25).

Madras, in Ma. 24 and 25, have, for the first time, attempted to put forth a new claim which they had not before presented at any stage of the proceedings. They contend that, while the second term of reference aims at preserving unimpaired the prescriptive rights of Madras, the award under that issue "specifies the limit volume of water at the Upper Anicut, which, *assisted and supplemented by a proportion of all excess flow over the limit*, will fully protect Madras interests." The portion italicised is an unwarranted addition which cannot be accepted by Mysore.

2. Madras state that certain passages in the Assessor's Examination can be interpreted to give the above meaning to the award. That Madras should draw such a conclusion from the clear and unmistakable terms of the award only shows that, not being content with the already high award against Mysore, they are trying to put a new and unwarranted meaning into certain expressions in the Assessor's examination of the case. If any weight is to be given to such one-sided interpretation, Mysore have only to observe that this would tantamount to the re-opening of the whole case under the second term of reference. To demonstrate the untenable nature of the contentions put forward by Madras, it is necessary to examine the import of the paragraphs in the Assessor's Examination of Evidence on which Madras rely for advancing this fresh claim.

3. While referring to possible benefit at times due to occasional floods, paragraph 98, Assessor's Examination, clearly states that, *apart from such occasional floods*, there is no reason to fear that the delta irrigation will in any way suffer "*provided that the irrigation supplies passed under the rules and regulations and shown to be necessary for their irrigation in the past* are taken as the basis for the award which must ensure their conservance in future." Here, evidently, the portion now italicised refers to the quantity of water represented by the award, *viz.*, 6½ ft. limit. The reference to *occasional floods* is made as a statement of fact and cannot be taken to imply the necessity for any additional supply under the award.

4. It is inevitable under any system of measurement out of the three under consideration—that, on several days or fortnightly period, there should be some surplus over and above the limit of 6½ feet mentioned in the award. But, as a full discussion on the several modes of measurement would be naturally out of place in examining the prescriptive rights of Madras, the Assessor has confined his remarks hypothetically to only one mode of measurement as an illustration to show that, under this proportionate system, there would be some portion of the floods available at the Cauvery Dam in addition to the prescriptive limit. It need hardly be remarked that the Assessor has made certain assumptions in these passages in a very guarded manner even in giving such an illustration.

5. It should also be noted that the Assessor has not attempted to examine, in the paragraphs under reference, the other two modes of measurement proposed by Madras and Mysore, respectively. If all this is remembered, the figures under illustration, or the remarks about the additional supplies, would not give any scope for the interpretation suggested by Madras to the effect that the award limit is to be "assisted and supplemented by a proportion of all excess flow over this limit to fully protect Madras interests."

6. If Madras still think that the references made by the Assessor in paragraphs 99 to 103 give room to them for claiming such an additional right, the natural inference must be that, in discussing the effects of impounding as an illustration under a particular system of measurement, the Assessor had by implication already condemned the other systems and had arrived at the conclusion that these latter need not even receive a passing consideration before being so condemned. Madras have evidently gone too far in forcing such an interpretation.

7. All that can be fairly inferred by the passages referred to by Madras, is that, in addition to the quantity specified by the award, which itself, as clearly stated in paragraph 103 (A.E.E.), would absolutely secure" the irrigation supplies to Madras under the 1892 Agreement", there will be generally a portion of floods available at the Upper Anicut, a condition which would obtain more or less under any of the three systems of measurement so far proposed.

8. A close reading of paragraph 165-A will show that the inference drawn by Madras in paragraph 5 of Ma. 25 is not warranted by the words used in the passage referred to.

9. Reference is also made by Madras to paragraphs 173 and 174 to support their view that a proportionate share of all floods is indeed an essential feature of the award on the second issue. A careful reading, however, of these paragraphs will show that, as there would generally be abundant floods available at the Cauvery Dam, any slight errors in the fixing of the limits, say between 6·2 feet and 7·0 feet would be almost wholly counterbalanced by the surplus floods available in a particular fortnight or period under consideration. It is true that such floods have reference to the illustration given in paragraphs 99 to 103 based on the proportionate system. But here the comparison only refers to the total quantity of supplies including the floods that would be available up to a certain limit. As such extra supplies would also be more or less available under any system of measurement, the passage does not warrant the inference that the particular mode of measurement under illustration was to be finally adopted.

10. If, on the other hand, Madras infer that these explanations of the Assessor give room to the assumption that this system alone has been upheld by the Assessor in preference to the other two, all that can be said is that such an inference is quite untenable in the face of the fact that the merits of the different systems could only be properly discussed when examining the third term of reference and not under any casual illustrative remarks made in dealing with the second issue. In this light it will be readily seen that Madras are taking undue advantage of certain hypothetical facts and figures mentioned by the Assessor in his Examination of the Evidence and are making a gratuitous assumption that the Assessor's recommendation is based on a pre-conceived preference to one out of three systems of measurement, without a detailed examination of their relative merits in the light of the award under the second issue.

11. Further, Madras are not justified in selecting two or three passages from the elaborate and detailed examination of the case by the Assessor and drawing certain unwarranted conclusions on the strength of such stray passages. On the contrary, Mysore can easily quote a number of passages from the same source as well as from the Findings of the Arbitrator, all of which prove convincingly that the award of 6½ feet limit by itself was intended to fully preserve unimpaired all the existing rights of Madras in perfect accordance with the wording of the second term of reference and that *no additional claim against Mysore* in the shape of a proportionate share of the flood waters, can be said to have been contemplated when making the award.

12. References to the following passages in the Assessor's Examination of Evidence with brief explanatory notes will make this point clear:—

(*a*) "*Paragraph* 6.—Madras have defined their claim as a prescriptive right to a limit flow whenever it is available in the river of 2,944 m.c.ft., about 33,500 cusecs, which, they state, is connoted by a 7 feet gauge on the Cauvery Dam under conditions obtaining at the time the 1896 rules were introduced, and prior to the remodelling of the Upper Anicut in 1899-1902. In support of this claim they rely entirely on the rules and records of regulation. They have made no attempt to show that the quantities of water actually taken into the Cauvery under the working of those rules and limit gauge have been essential to their irrigation in the past, and that they are therefore necessary to its conservance in future.

Vide paragraphs 9, 11, 13 and 15, Ma. 9.

Vide paragraph 18, Ma. 9.

"*Paragraph* 41.—On these grounds, I consider that the limits of the 1882 rules I and III of the Upper Anicut regulation read with the 1893 rules (1) and (2)

of the Cauvery and Vennar must be accepted as *the intentional* limit of what was considered necessary for irrigation supplies and that the provisions of rules (3), (4) and (5) of the Cauvery and Vennar rules must be accepted as for flood distribution between the two rivers."

These two passages show that the mere passing of flood waters or the incidence of flood discharge cannot be considered as necessary to conserve the prescriptive rights of Madras, as contrasted with the quantity of the award based on the actual volumes used for irrigation according to clauses (1) and (2) of the rules of 1893. The question of the new claim made by Madras for sharing floods as being necessary for the protection of their rights, is thus excluded.

(*b*) " *Paragraph* 78.—Hence, so far as the necessity for the extra supplies passed into the Coleroon under the 1882 rules, whether for the Coleroon irrigation or for scour, is concerned, I consider that Madras cannot be held to have proved their claim to this specific supply, and I consider that any fair and reasonable treatment of this point in terms of the 1892 Agreement demands its exclusion from the estimate of quantities due to Madras for the purpose of the award in this arbitration."

Here it is clear that a specific supply even for the Coleroon irrigation is not considered necessary beyond the award limit. In paragraph 6, Ma. 24, Madras try to make out that, in addition to the award of 6½ feet limit, a proportionate share of the floods would be necessary to meet the requirements of the Coleroon irrigation. But this passage clearly shows that extra claims over and above the award already given are unwarranted and contrary to the terms of the Agreement of 1892.

(*c*) "*Paragraph* 103.—Thus we see that, *while the irrigation supplies due to Madras under the 1892 Agreement would be absolutely secured*, she would still enjoy in addition increments over and above those necessary supplies."

This is one of the passages referred to by Madras in support of their claim for sharing of the flood waters as an additional burden against Mysore. But the passage italicised distinctly shows that the award by itself would amply protect and conserve all the prescripive rights of Madras, apart from extra flood discharges, more or less incidental to any system of measurement. Reference to increments *over and above the necessary supplies* and their being inevitably shared by the two parties are simply matters of actual occurrence and cannot be taken as the conditions of the award.

(d) " *Paragraph* 148.—A perusal of this seems to me to show very clearly that Sir John Benton thought the Kannambadi scheme feasible without injury to *Madras, whose rights he certainly did not under-rate.*"

The claim that Sir John Benton was considering is to a 7 feet limit flow and this claim is characterised as being above the Madras prescriptive rights. It may be remarked in passing that, if any claim for the proportionate share of flood waters over and above the prescriptive rights could at all stand in favour of Madras under the Agreement of 1892, Sir John Benton would not have declared in unmistakable terms " that the Mysore Durbar are to have all the surplus supplies to which they have any claim under the existing agreement placed unconditionally at their disposal." True to this recommendation, that officer then seriously suggested that the capacity of the Mysore reservoir should be increased from 41,000 m.c.ft. to as much as 72,000 m.c.ft.

(*e*) " *Paragraph* 160.—From this examination of the evidence under both these heads I find myself unable to advise the Arbitrator that the Madras claim for a 7 feet limit gauge at the Cauvery Dam throughout the irrigation season tested by the effect it can be shown to have had on the irrigation in the past can be accepted as having been proved to be essential to the conservance of their irrigation in future."

Here, evidently, the 7 feet limit claimed by Madras has been considered excessive in arriving at the award limit of 6½ feet. It is obvious that, as 7 feet flow itself is considered too much, there is no ground for seeking any supplementary or additional supplies from the floods on the basis of the award.

(f) " *Paragraph* 180.—

Kannambadi reservoir, if allowed, can only intercept the supply from some 1,000 square miles out of a total catchment area at the Cauvery Dam of some

26,000 square miles, and in any case, therefore, it can only affect a part of the total supply of the delta, while no impounding can be allowed which could restrict the delta irrigation supplies below the quantity found to have been used in the past and *to be necessary for its conservance in future.*"

(g) "*Paragraph* 181.—The Madras claims are by prescriptive right to a full and ample supply for the delta irrigation and it is in the nature of an essential principle *that the award given in this arbitration shall be such as to conserve those rights unimpaired.* . . . ."

Here the passages now italicised distinctly show that the award now given is based on the principle that, by itself it is sufficient to conserve fully the prescriptive right, *unassisted and unsupplemented*, by any portion of the excess flow over and above this limit.

(h) "*Paragraph* 185 [*sub-paragraphs* (1), (4) *and* (5)]."—Here sub-paragraph (1) refers to the quantity of award and the same principle, that the award by itself should conserve unimpaired the rights of Madras, is again reiterated;

Sub-paragraph (4) states that all quantities which cannot be shown to be necessary are to be excluded; and

Sub-paragraph (5) lays down that avoidable waste should also be excluded and the water passed into the Coleroon before remodelling is characterised as avoidable waste and as being unnecessary for the Coleroon irrigation. In this light the claim of Madras to a share of the flood waters to meet the Coleroon irrigation or to supplement the supply of the delta proper, becomes untenable.

(j) "*Paragraph* 187.—Under the interpretation by the Arbitrator of the Agreement of 1892 and in consideration of these three calculations, I suggest for consideration of the Arbitrator, that, for a fixed limit, if applied to the whole irrigation season, *6·5 feet of the Cauvery Dam* which, as read from the Madras curve of 1909, is equivalent to a discharge of 22,750 cusecs, *will fully safeguard the prescriptive right of Madras and will secure in the future the full irrigation supplies she has enjoyed in the past.*"

Here it is clear that the 6½ feet limit, or 22,750 cusecs, has been considered sufficient to fully meet the Madras rights. None of the proportionate share of flood waters, as attempted to be interpreted by Madras, was considered necessary *to aid or supplement* the award limit. If such was at all intended, a clear expression to that effect would have been added in the recommendation to the Arbitrator who would also have explicitly referred to it in his award.

13. This is not all. The Arbitrator also has made the import of the award quite clear in unmistakable terms and a few passages may be quoted from his Findings on issues *2* (*a*) and *2* (*b*):—

(*a*) *Page* 16.—"I must therefore hold, in agreement with the Assessor, that Madras have *failed* to establish their claim to a gauge-reading of *7 feet as necessary for the maintenance of their prescriptive rights* "

Here the intention of the Arbitrator as well as of the Assessor has been made as clear as possible and there is no room whatever to support the contention of Madras, *viz.*, that the award of 6½ feet by itself is not sufficient to protect their rights and that therefore it should be aided and supplemented by a proportion of the floods.

(*b*) *Page* 16.—"*Prima facie* it would appear that they are so entitled, but if it could be shown that so-called improvements only remedied defects due in themselves to a wasteful system adopted by Madras, that Government could not in equity be held entitled to the benefit of the waste. From the Assessor's Examination of the Evidence (paragraphs 66 to 86) it is clear that the system in force before the remodelling was a wasteful one and that large quantities were passed over the Upper Anicut and down the Coleroon which *served no useful purpose.* The Assessor has shown that the area under the Lower Coleroon irrigation system has increased, if anything, since the remodelling. I agree with his final conclusion that the *Madras claim on this point is untenable.*" (The italics are ours.)

Here also, the claim for a share in the flood waters to meet the requirements of Coleroon irrigation is clearly declared as untenable.

(*c*) *Page* 17.—"I have held *supra*, in agreement with the Assessor, that the Madras rules of 1882 aimed at ensuring when possible a gauge reading of over 6 feet at the Cauvery Dam, and that the Madras contention that the rules were intended to maintain a gauge of 7 feet could not be sustained.

Therefore, the gauge reading, which, according to the Madras Engineers in charge of the delta, *connoted a full and ample supply, was something between 6 and 7 feet.*"

Here, the mention of the full and ample supply as lying between the 6 and 7 feet limit would clearly indicate that no additional supply by way of proportionate share of floods over and above the award of 6½ feet, was intended as necessary to conserve Madras rights.

(*d*) *Page* 17.—"It is possible that Madras, in claiming the limit gauge of 7 feet, may have in view their new Metur project. That project is designed to irrigate an area of about 350,000 acres after making full provision for the delta irrigation. It would therefore appear that, in the opinion of the Madras Engineers, there is in the river, after meeting all the requirements of the delta irrigation, a surplus sufficient for the irrigation of 350,000 acres. It would follow that the gauge limit of 7 feet, which Madras now claim, *is more than sufficient for a full and ample supply to the existing irrigation.*"

Here, on the other hand, mention of the Metur project gives an indication that Madras have perhaps put forward their untenable and unwarranted claim to a proportionate share of the flood waters merely with the idea of putting unnecessary restrictions against impounding in Mysore, so that the flood waters accruing from such restrictions may all be stored in their Metur reservoir for extending their irrigation and thus increasing the already heavy burden of their prescriptive right against Mysore.

(*e*) *Page* 17.—"Coming now to the volume of water to which Madras is entitled for the conservance of their prescriptive right, I am advised by the Assessor that the supply of 22,750 cusecs, equivalent to a gauge-reading of 6·5 feet at the Cauvery Dam as calculated on the Madras curve of 1909, is a reasonable supply *for all the requirements of Madras irrigation.*"

Here the specific limit of 22,750 cusecs *unaided by proportionate share of floods* has been declared to be sufficient to meet *all the requirements of Madras.*

14. It is therefore clear from the numerous passages [(*a*) to (*j*) under paragraph 12 and (*a*) to (*e*) under paragraph 13] quoted above from the Assessor's Examination of Evidence and the Arbitrator's Findings, respectively, that no scope has been left for Madras to draw the inference that the award of 6½ feet limit was intended to be supplemented by a share of the flood waters for protecting Madras interests.

In the few passages alluded to by Madras, mention made of flood waters can only be taken to mean that, under any system of measurement, Madras may expect to get some portion of flood waters.

15. In the face of the clear exposition both in the Assessor's Examination of Evidence and the Arbitrator's Findings, there is no ground for Madras to infer that a share of the flood waters was intended to be an essential feature of the award under the second issue and to draw the conclusion that the passages referred to by them foreshadow the decision of the Arbitrator as regards the 3rd issue, even before the fundamentals of the latter had been considered. Thus it is clear that the award up to a limit of 6½ feet flow was by itself, and without any additional or supplemental supplies over and above that limit, considered sufficient to meet all the prescriptive rights of Madras.

16. The idea of useful surplus was first brought in by Mysore in My. 9, paragraphs 109—110, as a set-off against some portion of the compensation water necessitated by the Mysore system of measurement though this was then repudiated by Madras. Mysore then said that under any system of measurement in connection with any reservoir it would be practically impossible not to disturb in the least the flow within the prescriptive limits and that any little diminution, such as it was, would be more than counter-balanced by additional natural flow over and above the prescriptive limits, such excess flow being considered useful to Madras up to

certain higher limits specified by Madras themselves. Such extra flow over the prescriptive limits up to the Madras higher limits, was considered "useful surplus" intended to make up the more or less unavoidable deficit due to any system of measurement. It is in this sense that the question of useful surplus can at all come up for consideration and not in the new sense now put forward by Madras to the effect that this useful surplus should be considered as an extra burden on Mysore, in addition to the award of 6½ feet limit. Such an interpretation has been shown to be quite untenable.

17. The statement of Madras that their objection against the expression "useful surplus" was withdrawn as soon as the conditions of the award were declared (Ma. 25, paragraph 7), cannot count for anything at this stage as tending to establish a fresh burden on Mysore in addition to the limit flow of 6½ feet distinctly specified in the award.

18. Madras have stated that their contention that a share in the flood waters is necessary to fully protect Madras interests, receives support from the passage in the Arbitrator's Findings. This requires an examination now.

The Arbitrator, in summing up the case on page 17, states that the gauge-reading under the award "*must connote a full and ample supply for the requirements of Madras irrigation.* That standard being fixed, it has still to be decided what surplus is available *after Madras requirements have been met*, what proportion of that surplus may reasonably be claimed by Mysore and whether the Mysore project for utilising the surplus is a feasible one."

Here also, the reference made to the surplus or even the sharing of it, does not leave any the slightest room to contend that the award of 6½ feet by itself is not sufficient to meet the Madras requirements in the face of the portions now italicised in the above passage.

19. Mysore have all along been contending that they have the first claim to the surplus after meeting the Madras requirements as far as available at their reservoir site, or, in other words, as far as can be utilised through their reservoir. It is evidently to settle the quantity of surplus thus to be utilised by Mysore, that the expression "what proportion of that surplus may reasonably be claimed by Mysore" has been used.

In this light, Mysore once more repeat that the terms of the award give no room for imposing an additional burden on Mysore in the shape of a share of the flood waters, which Madras now "accept as useful surplus."

20. Even the Mysore system must leave, and actually leaves, a good portion of the surplus at the disposal of Madras on nearly all the days on which impounding is done. The difference between the proportionate limit system and the Mysore system in the matter of leaving some surplus is only one of degree and not of kind. So the arguments about the surplus waters used by the Assessor will not be inapplicable to the Mysore system. To suggest that the remarks of the Assessor in the passages referred to by Madras about the flood supplies, at once determine the mode of measurement to be the proportionate system only, is quite unjustifiable.

Ma. 25, paragraph 8.

21. If the new idea of sharing the flood waters is left out of consideration, there is no reason why the Mysore system of measurement must prove seriously detrimental to Madras irrigation in bad years, provided that, on all fair and reasonable considerations, it is found that any slight deficit occasionally occurring on a day or two, is more than amply made up by the useful surplus, this expression being used in the sense intended by Mysore (*vide* paragraph 16 above).

Ma. 25, paragraph 9.

22. Now that it has been shown that the contentions regarding an additional and supplementary supply are untenable and that the limit quantity of the award by itself conserves all the rights of Madras, the original admission of Madras, that the principle of the Mysore system, apart from compensation clauses, is generally acceptable, must be held.

In this light, it is hardly necessary to urge that the Mysore system should be judged in comparison with the other systems, only with reference to the conserving of the quantity within the prescriptive limits and not with reference to the sharing

of any floods over and above the prescriptive limits. If it is found that the slight deficits in the shape of compensation water are more than made up by the useful surplus immediately available, the system should, on all fair and reasonable considerations, prove acceptable to both the parties.

23. Mysore do not agree with the general objections raised against the Mysore system that it will impair existing rights to full control and development of works in the basin of the Cauvery below Mysore and above the Upper Anicut and that it is impossible to make accurate measurements of compensation water. But, as a sort of compromise, they have agreed to adopt the somewhat higher proportions of 0·625 and 0·30, instead of 0·55 and 0·25 for the two seasons, the computation of compensation water being then obviated, as any slight loss by such omission would be made up by the useful surplus generally occurring at the time.

Ma. 25, paragraphs 14, 17 and 18

24. As regards omission of the computation of compensation water with increased factors, Madras state that the system "with the higher factors and without compensation water" is, in the view of the Madras Government, decidedly the one to be preferred.

Ma. 25, paragraph 20.

25. It has been made quite clear that the essential principles underlying the examination of the case referred to in paragraph 103, A.E.E., can only refer to the inevitable causes producing a surplus flow at the Cauvery Dam over and above the award limit on many days under any system of measurement. It has also been shown that, even under the Mysore system, this essential feature of impounding is not materially interfered with, as indeed the number of days on which surpluses occur with impounding, is not very much less than the number of days without it. As repeatedly stated, the hypothetical remarks of the Assessor can, in no manner, be taken to indicate any premature acceptance of the proportionate limit method.

Ma. 25, paragraphs 21 and 22.

26. Madras state that, of the Mysore system and the proportionate system now compared, the proportionate system is the one considered in making the award and the only one which can fulfil the intention of that award. If this were so, there would be no necessity for any discussion now under the third term of reference.

Ma. 25, paragraph 23.

27. Under paragraph 24, Ma. 25, Madras have given a table showing how they are able to get a proportion of the flood on each day when impounding is done in Mysore, but they have omitted to note the most vital point whether such sharing of the floods is really necessary to conserve their prescriptive right. Such a necessity would only arise when the resulting flow at the Cauvery Dam under the hypothetical discharges at Kannambadi assumed by Madras, would at all fall short of the 6½ feet limit even under the Mysore system of impounding. The table is revised so as to show this aspect and to readily exhibit that the hypothetical discharges at Kannambadi would give more than ample resulting flow at the Cauvery Dam, as per column 7; and the surpluses are shown in column 8—*vide* statement A attached. The corresponding surpluses by the proportionate system are shown in column 13. Here, under the Mysore system, the surplus varies from 525 m.c.ft. to 4,600 m.c.ft., over and above 1,950 m.c.ft. limit. Under the proportionate system, the surplus will vary from 645 to 5,595 m.c.ft. This alone would show that such large surpluses cannot be intended to supplement the award limit of 6½ feet and Madras must therefore have a different motive in laying claim to such a large quantity of floods in the face of the fact that it is not required to conserve their prescriptive rights. Thus, all the arguments brought forward by Madras in favour of the proportionate system and against the Mysore system on the plea of supplementary supply to the award, to conserve the prescriptive rights. are stultified by the natural conclusions that can be drawn from the very figures given by Madras.

The share in the flood waters cannot, in the face of these figures, be considered an essential feature of the award for protecting the prescriptive right.

Conclusion.

28. It has already been stated in My. 22 that Mysore strongly object to the contention raised by Madras in Ma. 24 that the sharing of the surplus waters over and above the award of 6½ feet limit forms a part of the award.

Madras have, in Ma. 25, referred to several passages in the Assessor's Examination of the evidence and Arbitrator's Findings and have tried to show throughout their note that the sharing of the surplus waters forms an essential feature of the award, but Mysore have adduced sufficient and ample evidence from the same documents to disprove the soundness of the Madras contention.

29. It only remains to offer a few general remarks about the award and the mode of measurement to be selected. While Mysore have, in the presentation of their case on the second issue, contended that a limit of 6 feet in the height of the monsoon, and lower limits, in other months, would meet all the legitimate requirements of Madras irrigation, an award of 6½ feet has been given. Having secured this already large award, there can be no room for Madras to claim any surplus floods in addition as an integral part of the award and contend that the mode of measurement must ensure the passing of such surplus floods. On the other hand, the problem should be what mode of measurement should be adopted so that all available floods over and above the prescriptive limit due to Madras may be impounded in Mysore as far as practicable.

30. The Arbitrator has surmised that Madras in claiming a limit gauge of 7 feet may have in view their new Metur project. The extra claim now put forward by Madras to the surplus waters gives room for a confirmation of this view. If the surplus waters so claimed by Madras are to be utilised for extending their irrigation by means of their reservoir, Mysore have to repeat their argument in My. 1, paragraph 26, here quoted for ready reference: "If Madras constructs a reservoir in future, the restrictions now sought to be imposed should be relaxed in favor of Mysore. Also, should Madras extend irrigation in future, Mysore should not be made to submit to any further restrictions arising from rights to be acquired in future on that account without its previous consent."

31. It is therefore urged that the mode of measurement, while allowing due conservance of the Madras prescriptive rights, should be such as would not countenance the sharing of floods as an essential feature.

Special attention of the Arbitration Committee is invited to Sections 7 and 8, My. 1, and also to paragraph 14 of the Summary of the Mysore Case, My. 16, where it has been clearly stated that both the award and the mode of measurement to be settled by this Arbitration should be such as would not put unnecessary restrictions on Mysore in utilising all the surplus waters, as far as practicable, when the prescriptive rights of Madras are duly fulfilled.

32. In consideration of the large contribution of over two-thirds of the supply of the Cauvery river as it leaves the Mysore territory and in consideration also of the fact that Madras have more than 1,200,000 acres of irrigation under that river, it would not be too much for Mysore to claim that facilities should be given, on all fair and reasonable considerations, to have at least one-fourth of the total area of irrigation in the Cauvery basin or $\frac{(1{,}225{,}000 + 110{,}000)}{4} = 334{,}000$ acres.

It is urged that, if unnecessary restrictions regarding the sharing of surplus waters is to be made one of the features of the mode of measurement, Mysore would be placed in a highly disadvantageous situation, while Madras would be free to have facilities for extending their irrigation out of the very surplus waters which they are now claiming.

It is only by storing the flood waters in large reservoirs, similar to the one now proposed, that Mysore can extend their irrigation so as to get a fair and proportionate benefit from the large contribution made through their territory.

It is therefore urged that no undue restrictions should be imposed against the construction of reservoirs in Mysore beyond what is necessary to protect the prescriptive rights on all fair and reasonable considerations according to the Agreement of 1892.

KARPUR SHRINIVASRAV,
Mysore Representative.

9th April 1914.

9

Enclosure A.

Month and date	Mysore system											Proportionate system				
	Approximations for quantity to be impounded					Conditions at the Cauvery Dam										
	Y = Flow at Kannambadi in m. c. ft.	Ny = Probable flow at the Cauvery Dam N = From June to September N = From October to January	N-Z = Probable excess over the limit at the Cauvery Dam Z = Limit in column 16	$\frac{N-Z}{c}$ = Value of column 2 (*c*) at Kannambadi Dam, *i.e.*, of column 2 (*c*)	Quantity to be impounded at Kannambadi Dam column 2 (*d*) or 2 (*a*) whichever is less	Flow at the Cauvery Dam in m.c. ft. four days later	Value of column 2 (*e*) at the Cauvery Dam of column 2 (*c*)	Net flow at the Cauvery Dam column 3–column 4+of surplus at Kannambadi, if any	Compensation water column 3 if less than Z or Z—column 5 Z = Limit in column 16	Resulting flow at the Cauvery Dam column 5 + column 6 four days previous	Surplus quantity above the limit at the Cauvery Dam	Percentage of column 8 on 1950	Quantity lost by Mysore by the third system	Equivalent of above at Cauvery Dam	Total flow at Cauvery Dam by proportionate system	Surplus above 1950	Percentage on 1950
1	2*a*	*b*	*c*	*d*	*e*	3	4	5	6	7	8	9	10	11	12	13	14
1	1,219	1,950	...	...	...	1,950	...	1,950	...	1,950	...	...	...	...	1,950	...	...
2	2,000	3,200	1,250	1,613	1,613	3,200	1,250	1,950	...	1,950	...	...	832	645	2,595	645	33·1
3	2,361	3,782	...	...	2,361	3,782	1,832	1,950	...	1,950	...	...	1,219	945	2,895	945	48·4
4	3,000	4,800	...	...	3,000	4,800	2,325	2,475	...	2,475	525	26·9	1,219	945	3,420	1,470	75·3
5	4,000	6,400	...	...	4,000	6,400	3,100	3,300	...	3,300	1,350	69·2	1,219	945	4,245	2,295	117·7
6	5,000	8,000	...	...	5,000	8,000	3,875	4,125	...	4,125	2,175	111·5	1,219	945	5,070	3,120	160·0
7	6,000	9,600	...	...	6,000	9,600	4,650	4,950	...	4,950	3,000	153·8	1,219	945	5,895	3,945	202·3
8	7,000	11,200	...	...	7,000	11,200	5,425	5,775	...	5,775	3,825	196·1	1,219	945	6,720	4,770	244·6
9	8,000	12,800	...	...	8,000	12,800	6,200	6,600	.	6,600	4,650	238·4	1,219	945	7,545	5,595	286·9

Exhibit My. 24.

Reply of Mysore to Madras Note Ma. 25-Working Tables.

The factors proposed by Mysore, *viz.*, 0·55 and 0·25 with compensation water and 0·625 and 0·30 without it, will be found to be fair on a further consideration with the understanding that the results are to be judged with reference to the effect on the four bad years, *viz.*, 1899-1900, 1904-05, 1905-06 and 1908-09.

Reference-Madras paragraph 26.

The proportion for the south-west monsoon for these four years varies from ·61 to ·43 and the average comes to 0·53 against 0·55 chosen. Similarly, the proportion for the north-east monsoon varies from ·40 to ·17 and averages to about ·27 against ·25 chosen by Mysore. The higher proportions ·625 and 0·3 will be found to be acceptable as they are much higher than the average proportions and, in consideration of such higher proportions, Mysore claim that the compensation water computation may be waived.

If proportions for the seasons are not acceptable, shorter periods by months may be taken on the same principle of average flow for each month and the impounding limits too should be made dependent on such proportions for the respective months.

2. The abstracts (*a*), (*b*), (*c*), (*d*) and the percentage statements (*a*), (*b*), (*c*), (*d*) based upon these abstracts, are worked out on a wrong principle against which Mysore have to record a protest. The quantities and percentages marked in table (*a*), *i.e.*, the deficit due to the impounding in Mysore on the total quantity of natural flow, convey no meaning so far as Madras prescriptive rights are concerned and therefore do not require any further notice.

Reference-Madras paragraphs 26 to 31.

Coming to table (*d*), Mysore admit that the deficits there shown are due to the compensation water and this question will be dealt with separately.

As regards the tables (*b*) and (*c*) which show deficits of actual supplies on the totals up to a limit of 2,944 m.c.ft. and 2,300 m.c.ft., respectively, it is not understood what Madras want to make out by showing these deficits. Certainly, they cannot imply that, in the face of the award of a limit of 6½ feet or 1,966 m.c.ft. dealt with in abstract (*d*), they have got any claim for the flow up to the limit quantities 2,300 or 2,944 m.c.ft.; therefore the inferences that they have drawn about the deficits in abstracts (*b*) and (*c*) do not require any notice, as Mysore repudiate such assumptions and the consequent inferences.

3. The figures representing the total actual flow up to the limits of 2,300 and 2,944 m.c.ft., however, can be made use of in a different and more reasonable way. The difference between these figures and the total up to a limit flow of 1,966 m.c.ft. would constitute really the useful surplus in the sense originally used by Mysore and further fully explained in paragraph 16 of their note My. 23, dated 5th April. This difference between the quantities under abstracts (*c*) and (*d*) or (*b*) and (*d*) would really represent the quantities placed at the disposal of Madras over and above what is due to them by the award and Mysore claim that this extra quantity constituting " the useful surplus " in their sense of the expression, should be treated as a set-off against the slight differences between the actual and the limit flow shown in abstract (*d*).

4. The percentages marked even in the abstract (*d*), with which alone we have now to deal for reasons explained above, are misleading without the actual quantities from which these percentages have been derived.

Fresh statements have now been prepared showing the compensation water, the useful surplus and the effect on the Mysore impounding, etc., for the four years 1899-1900, 1904-05, 1905-06, 1908-09, as the Assessor has desired that he would concentrate his examination of the working tables to these years.

5. Accordingly, four statements have now been prepared by Mysore for each of the four years noted above and in each statement the more important features under the two methods of impounding with different factors have been shown as under:—

Number of table	Method	South-west factors	North-east factors
Madras			
IX	Mysore	·7	·45
X	Proportionate	·65	·425
XI	Mysore	·6	·4
XII	Proportionate	·6	·4
Mysore			
My. 21-H	Mysore	·625	·3

6. Taking the year 1899 and comparing the tables XII and XI, the disadvantages of the proportionate system against Mysore as compared with the Mysore system, for the same factors ·6 and ·4, can be readily seen—

(*a*) Quantity available for impounding by table XI is 34,086 m.c.ft. [column (3)] against only 18,958 m.c.ft. [column (3)] by the proportionate system. This means that Mysore only get a little over half the quantity in the latter.

(*b*) But the quantity actually utilised is 34·34 per cent [column (2) of the total flow by the Mysore system] against only 23·3 per cent. [column (2) of the total by the proportionate system]. This shows that Mysore get by the proportionate system only about two-thirds of the water they would receive by the Mysore system.

(*c*) The deficit in the quantity necessary for irrigation in table XI is 8,613 m.c.ft. [column (6)] against 13,588 m.c.ft. [column (6) in table XII] by the proportionate system. The deficit is nearly one and three-fourths times greater in the proportionate system than the corresponding quantity in the Mysore system with the same factors.

7. The effect on the Madras supplies under the two systems for the same year may be examined—

(i) The flow at the Cauvery Dam exceeds 1,966 m.c.ft. on 30 days [column (3)] in the year, without impounding, against the same number of days under both the systems of impounding [column (*g*)]. This alone proves convincingly that it should make no difference to Madras whether table XII or table XI is adopted, whereas the disadvantages to Mysore in the former case are very serious as noted above.

(ii) There is, however, a deficit of 475 m.c.ft. [column (*c*)] below the limit flow in the proportionate method, although this method has been recommended simply with the idea of avoiding this deficit. It is now seen that such deficit cannot be avoided.

(iii) The deficit of 549 m.c.ft. [column (*c*)] by the Mysore method, is more than made up by the large quantity of useful surplus of 9,218 m.c.ft. [column (*f*)] if taken up to a limit of 2,300 m.c.ft. or of 21,357 m.c.ft. [column (*h*)] if taken up to a limit of 2,944 m.c.ft. So the question of compensation water cannot count as a factor against the Mysore system.

8. Thus, the comparison of the tables clearly shows that, while Madras interests are left quite intact by the Mysore method, extra facilities are given to Mysore for impounding. On the other hand, the adoption of the proportionate method will deprive Mysore of a large quantity of legitimate storage and this cannot by any means prove acceptable to Mysore.

9. Mysore, however, have already consented to increase the factors to ·625 and ·3 provided all account of compensation water is to be obviated and so the effect of adopting this table on Madras may be examined.

(*a*) Here too, the number of days when the resulting flow exceeds the limit, remains the same, *viz.*, 30 days [column (*g*)] without impounding.

(*b*) The quantity of deficit below the limit is only 910 m.c.ft. [column (*c*)], but this is amply made up by the very large surplus flow of 9,319 m.c.ft. [column (*f*)] if taken up to 2,300 m.c.ft. limit and of 21,576 m.c.ft. [column (*h*)] if taken up to a limit of 2,944 m.c.ft.

10. Thus, so far as the year 1899-1900 is concerned, Madras interests would be perfectly safeguarded by the Mysore method (·625 and ·3 factors) without compensation and there can be no reasonable objection against the Mysore proposal so far as this year is concerned.

11. Now, taking the next bad year 1904-05, a comparison of tables XII and XI with the same factors will clearly show that the loss to Mysore regarding the quantity available for impounding is reduced from 102,170 m.c.ft. [column (3)] to 71,144 m.c.ft. [column (3)] and the quantity actually utilised from 13·1 [column (2)] to 12·9 per cent [column (2)] of the total flow at Kannambadi.

The conditions at Cauvery Dam, so far as the number of days when the resulting flow is greater than the limit of 1,966 m.c.ft. are concerned, are more advantageous in the Mysore method than even in the proportionate system, being 58 and 57 days [column (*g*)] respectively, against 58 days [column (3)] with the natural flow. The deficit below the limit is 1,713 m.c.ft. [column (*c*)] by the proportionate method against only 935 [column (*c*)] by the Mysore method. Hence there can be no justification to choose the proportionate method on the plea of avoiding such deficits. Even the small deficit is more than made up by the useful surplus under the Mysore system.

12. Now, coming to the merits of the factors ·625 and ·3 recommended by Mysore without compensation water, the number of days when the resulting flow is over the limit of 1,966 m.c.ft. is 56 [column (*g*)], against 58 [column (3)] without impounding, and this cannot be considered a drawback on all fair and reasonable considerations. The quantity of deficit supply has happened in the second-half of September and the second-half of October; but in the first of these two fortnights, it will be observed that the resulting quantities at the Cauvery Dam, *viz.*, 12,777 m.c.ft. [column (*a*)] is nearly the same as 13,245 m.c.ft. [column (49)], the quantity provided for in the Metur project.

A somewhat greater deficit, however, happens in the second-half of October, but the resulting flow in this period is far greater than the quantity provided for in the Metur Project [column (49)]. Hence there can be no objection to the Mysore method on the score of deficit below the prescriptive limit. Thus, for the year 1904-05 also, the tables show that the Mysore proposal can be accepted without any loss to Madras.

13. Taking the next year 1905-06 and comparing the two tables XII and XI, it is found that the quantity available for impounding by Mysore method, *viz.*, 43,825 m.c.ft. [column (3)] is nearly halved by the proportionate method, while the quantity actually impounded is reduced to about two-thirds, *i.e.*, from 21·26 per cent. [column (2)] to 14·04 per cent. [column (2)] of the total flow at Kannambadi. The consequence is that the shortage in the supply for irrigation below the normal is increased from 4,706 m.c.ft. [column (6)] to as much as 10,023 m.c.ft. [column (6)]. This is an extremely unfavourable condition to Mysore, because as much as $\left\{\frac{10,023-4,706}{37,080}\times 100=\right\}$ 15 per cent. of the normal storage of the reservoir is denied to Mysore by the mere selection of the proportionate system. Examining the effects in the resulting flow at the Cauvery Dam, it is found that the deficit is 805 m.c.ft. [column (*c*)], under the proportionate system, against 1,262 m.c.ft. [column (*c*)] in the Mysore system. This small difference cannot really count for much as this is also made up by the abundant useful surplus as shown.

14. Coming to the table recommended by Mysore, it will be seen that the deficit below the limit of 1,966 m.c.ft. is only 3,103 m.c.ft. [column (*c*)] and happens on six days and it will be seen that each of these deficits is abundantly made up by the useful surplus of 8,668 m.c.ft. [column (*f*)] if taken up to a limit of 2,300 m.c.ft. It will also be observed that a deficit of each fortnight is more than made up by the abundant useful surplus occurring in the same fortnight.

Hence, it has been shown so far as 1905-06 is concerned, all the Madras interests would be fully and properly served by accepting the Mysore recommendation.

15. Taking the year 1908 for tables XII and XI, it is found that the disadvantages to Mysore are serious by adopting the proportionate limit method; for the quantity available for impounding by the Mysore method is 114,648 m.c.ft.

[column (3)] ; and this is reduced to only 78,857 m.c.ft. [column (3)] by the proportionate method.

The effects on Madras supplies remain more or less the same by the two methods and therefore there is no reason why the proportionate method should be preferred, particularly as this would mean so much additional restriction on impounding in Mysore.

16. The results of the system recommended by Mysore show only a deficit of 3,468 m.c.ft. [column (*c*)], which is more than made up by the abundant useful surplus up to 29,368 m.c.ft., as shown in column (*h*) factors ·625 and ·3.

17. Thus, in all the four years under examination, it has been clearly shown by the actual facts and figures that the Mysore method with (·625 and ·3) factors and without compensation water would duly safeguard the Madras prescriptive rights and so the objections against the system made on the score of sharing of surplus waters must be held to be quite untenable.

18. It only remains to be stated that the adoption of the proportionate system with factors of ·65 and ·425 and of the Mysore system with factors ·7 and ·45 as recommended by Madras, would be quite against Mysore interests on account of the undue restrictions against impounding. Such restrictions must only result in a very large quantity of the resulting flow at the Upper Anicut being wasted into the sea or being utilised for storage in their proposed Metur Reservoir, both being quite against the interests of Mysore.

KARPUR SHRINIVASRAV,

9th April 1914. *Mysore Representative.*

Exhibit My. 24-a

1899-1900.

XII — ·6 and ·4 Third system

Period		Natural flow up to 1,966 m.c.ft.	Number of days beyond 1,966 m.c.ft.	Actual flow up to 1,966 m.c.ft.	Number of days of impounding	Deficit up to 1,966 m.c.ft. — Quantity	Deficit up to 1,966 m.c.ft. — Number of days	Percentage of column 6 on column 2	Useful surplus up to 2,300 m.c.ft. — Quantity	Useful surplus up to 2,300 m.c.ft. — Number of days beyond 1,966 m.c.ft.	Useful surplus up to 2,944 m.c.ft. — Quantity	Useful surplus up to 2,944 m.c.ft. — Number of days beyond 2,300 m.c.ft.
1		2	3	4	5	6	7	8	9	10	11	12
				a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*k*
ne	First half ...	4,696	...	4,696	...	...	...	...	...	...	...	..
	Second half ...	19,248	6	19,046	6	202	1	1·0	1,999	6	5,181	5
ly	First half ...	26,612	13	26,612	9	...	...	...	4,337	13	10,912	12
	Second half ...	16,330	2	16,330	1	...	...	...	365	2	555	1
gust	First half ...	7,141	...	6,868	2	273	2	3·8	...	...	...	...
	Second half ...	10,588	...	10,588	...	...	...	...	...	...	...	...
ptember...	First half ...	18,511	3	18,511	...	...	...	...	735	3	1,065	1
	Second half ...	20,691	6	20,691	1	...	...	...	1,883	6	4,436	5
tober ...	First half ...	7,340	...	7,340	...	...	...	...	...	...	...	...
	Second half ...	10,315	...	10,315	...	...	...	...	...	...	...	...
vember...	First half ...	5,830	...	5,830	...	...	...	...	...	...	...	...
	Second half ...	1,501	...	1,501	...	...	...	...	...	...	...	...
ecember ...	First half ...	938	...	938	...	...	...	...	...	...	..	...
	Second half ...	482	...	482	...	...	...	...	...	...	...	...
nuary ...	First half ...	782	...	782	...	..	...	...	...	...	...	...
	Second half ...	552	...	552	...	...	...	...	...	...	...	...
Total ...		1,51,560	30	1,51,065	19	475	3	...	9,319	30	22,169	24

XI — ·6 and ·4 Mysore system with compensation

Period		Actual flow up to 1,966 m.c.ft.	Number of days of impounding	Deficit up to 1,966 m.c.ft. — Quantity	Deficit up to 1,966 m.c.ft. — Number of days	Percentage of column 15 on column 2	Useful surplus up to 2,300 m.c.ft. — Quantity	Useful surplus up to 2,300 m.c.ft. — Number of days beyond 1,966 m.c.ft.	Useful surplus up to 2,944 m.c.ft. — Quantity	Useful surplus up to 2,944 m.c.ft. — Number of days beyond 2,300 m.c.ft.
1		13	14	15	16	17	18	19	20	21
		a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*k*
ne	First half ...	4,696	...	...	...	...	...	...	...	...
	Second half ...	18,699	6	549	1	2·9	1,898	6	4,474	4
ly	First half ...	26,612	9	...	...	...	4,337	13	10,932	12
	Second half ...	16,330	1	...	...	...	365	2	532	1
gust	First half ...	7,714	2	+567	2	...	...	...	...	...
	Second half ...	11,155	...	−567	2	...	...	...	...	...
ptember...	First half ...	18,511	...	...	...	...	735	3	1,065	1
	Second half ...	20,691	1	...	...	...	1,883	6	4,354	5
tober ...	First half ...	7,340	...	...	...	...	...	...	...	...
	Second half ...	10,315	...	...	...	...	...	...	...	...
vember...	First half ...	5,830	...	...	...	...	...	...	...	...
	Second half ...	1,501	...	...	...	—	...	...	...	...
ecember ...	First half ...	938	...	...	...	...	...	...	...	...
	Second half ...	482	...	..	...	...	...	...	...	...
nuary ...	First half ...	782	...	...	...	...	...	...	...	...
	Second half ...	552	...	...	...	...	...	...	...	...
Total ...		1,51,011	19	549	5	...	9,218	30	21,357	23

My. 21 H. — ·625 and ·3 Mysore system without compensation

Period		Actual flow up to 1,966 m.c.ft.	Number of days of impounding	Deficit up to 1,966 m.c.ft. — Quantity	Deficit up to 1,966 m.c.ft. — Number of days	Percentage of column 24 on column 2	Useful surplus up to 2,300 m.c.ft. — Quantity	Useful surplus up to 2,300 m.c.ft. — Number of days beyond 1,966 m.c.ft.	Usful surplus up to 2,944 m.c.ft. — Quantity	Usful surplus up to 2,944 m.c.ft. — Number of days beyond 2,300 m.c.ft.
1		22	23	24	25	26	27	28	29	30
		a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*k*
ne	First half ...	4,696	...	...	...	...	...	...	...	...
	Second half ...	18,774	6	474	1	2·4	1,999	6	4,588	5
ly	First half ...	26,612	9	...	...	...	4,337	13	10,932	12
	Second half ...	16,330	..	...	...	...	365	2	555	1
gust	First half ...	6,705	2	436	2	6·10	...	...	...	...
	Second half ...	10,588	...	...	...	...	...	...	...	...
ptember...	First half ...	18,511	...	...	...	...	735	3	1,065	1
	Second half ...	20,691	1	...	...	...	1,883	6	4,436	5
tober ...	First half ...	7,340	...	...	..	...	..	...	...	..
	Second half ...	10,315	...	...	...	...	...	...	...	...
vember...	First half ...	5,830	...	...	...	...	...	...	..	...
	Second half ...	1,501	...	...	...	...	...	...	...	...
ecember ...	First half ...	938	...	...	...	...	...	..	...	...
	Second half ...	482	...	...	...	...	...	...	...	...
nuary ...	First half ...	782	...	...	...	...	...	...	...	...
	Second half ...	552	...	...	...	...	...	...	...	...
Total ...		1,50,650	18	910	3	...	9,319	30	21,576	24

X — ·65 and ·125 Proportionate system or third system

Period		Actual flow up to 1,966 m.c.ft.	Number of days of impounding	Deficit up to 1,966 m.c.ft. — Quantity	Deficit up to 1,966 m.c.ft. — Number of days	Percentage of column 33 on column 2	Useful surplus up to 2,300 m.c.ft. — Quantity	Useful surplus up to 2,300 m.c.ft. — Number of days beyond 1,966 m.c.ft.	Useful surplus up to 2944 m.c.ft. — Quantity	Useful surplus up to 2944 m.c.ft. — Number of days beyond 2,300 m.c.ft.
1		31	32	33	34	35	36	37	38	39
		a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*k*
ne	First half ...	4,696	...	...	..	..	...	...	...	...
	Second half ...	19,106	6	142	1	0·71	1,999	6	5,219	5
ly	First half ...	26,612	9	...	...	..	4,337	13	11,111	12
	Second half ...	16,330	...	...	...	...	365	2	555	1
gust	First half ...	7,015	1	126	1	1·76	...	...	...	...
	Second half ...	10,588	...	...	...	..	...	...	...	...
ptember...	First half ...	18,511	...	...	...	..	1,035	3	1,065	1
	Second half ...	20,691	1	...	...	...	1,883	6	4,872	5
tober ...	First half ...	7,340	...	...	...	...	...	...	..	...
	Second half ...	10,315	...	...	...	...	...	...	...	...
vember...	First half ...	5,830	...	...	...	...	...	...	...	...
	Second half ...	1,501	...	...	...	...	...	...	...	...
ecember ...	First half ...	938	...	...	...	...	...	...	...	...
	Second half ...	482	...	...	...	...	...	..	...	...
nuary ...	First half ...	782	...	...	...	...	...	...	...	...
	Second half ...	552	...	...	...	...	...	...	...	...
Total ...		..	17	...	...	...	...	...	...	...

IX — ·7 and ·45 Mysore system with compensation

Period		Actual flow up to 1,966 m.c.ft.	Number of days of impounding	Deficit up to 1,966 m.c.ft. — Quantity	Deficit up to 1,966 m.c.ft. — Number of days	Percentage of column 42 on column 2	Useful surplus up to 2,300 m.c.ft. — Quantity	Useful surplus up to 2,300 m.c.ft. — Number of days beyond 1,966 m.c.ft.	Useful surplus up to 2,944 m.c.ft. — Quantity	Useful surplus up to 2,944 m.c.ft. — Number of days beyond 2,300 m.c.ft.	Supply as per Metur project	Remarks
1		40	41	42	43	44	45	46	47	48	49	50
		a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*k*		
ne	First half ...	4,696	...	...	...	...	...	...	...	...	3,105	
	Second half ...	19,008	6	200	1	1·5	2,019	6	4,744	5	3,105	
ly	First half ...	26,612	9	...	...	..	4,337	13	10,588	12	25,110	
	Second half ...	16,330	...	..	..	...	365	2	555	1	26,000	
gust	First half ...	7,046	1	−95	...	...	7,046	..	7,046	...	23,700	
	Second half ...	10,683	..	+95	..	...	10,683		10,683	...	25,280	
ptember...	First half ...	18,511	...	...	...	...	...	3	...	2	22,305	
	Second half ...	20,691	1	..	...	...	...	6	..	5	13,245	
tober ...	First half ...	7,340	...	...	..	...	...	..		...	14,925	
	Second half ...	10,315	...	...	...		..	...	..	...	9,984	
vember...	First half ...	5,830	...	...	...	...	...	...	..	...	7,500	
	Second half ...	1,504	...	...	...	...	...	...	...	...	7,500	
ecember ...	First half ...	938	...	...	...	...	..	.	...	...	5,140	
	Second half ...	482	...	...	...	...		...	...	...	1,392	
nuary ...	First half ...	782	...	...	...	...		...	...	...	1,890	
	Second half ...	552	...	...	...	...		...	.	...	..	
Total ...		...	...	...	...	...	...	...	...	...	1,90,481	

	Percentage of quantity available for impounding to total flow at Kannambadi	Percentage of quantity impounded to total flow at Kannambadi	Quantity available for impounding	Total draw-off including evaporation power	Case applied	Shortage in irrigation supply	Surplus at Kannambadi after satisfying Madras conditions
	1	2	3	4	5	6	7
XII	23·3	23·3	18,958	32,282	H	13,588	...
XI	41·9	34·34	34,086	45,418	F	8,613	4,480
My. 21 H.	40·2	34·0	32,729	39,167	G&F	10,110	3,659
X	21·08	21·08	17·166	24,707	H	15,886	
IX	33·87	33·25	27,558	41,020	H	11,128	...

Exhibit My. 24-d

1908-1909.

Natural flow up to 1,966 m.c.ft.	Number of days beyond 1,966 m.c.ft.	XII — ·6 and ·4 Third system: Actual flow up to 1,966 m.c.ft.	Number of days of impounding	Deficit up to 1,966 m.c.ft.: Quantity	Deficit up to 1,966 m.c.ft.: Number of days	Percentage of column 6 on column 2	Useful surplus up to 2,300 m.c.ft.: Quantity	Useful surplus up to 2,300 m.c.ft.: Number of days beyond 1,966 m.c.ft.	Useful surplus up to 2,911 m.c.ft.: Quantity	Useful surplus up to 2,911 m.c.ft.: Number of days beyond 2,300 m.c.ft.
2	3	4	5	6	7	8	9	10	11	12
a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*k*		
2,382	...	2,382	...	...	...	...	...	...		
5,270	...	5,270	...	...	...	...	...	...		
20,967	7	20,674	9	293	3	1·88	1,641	6	2,963	3
30,204	14	29,608	16	596	4	1·97	3,829	11	10,657	10
29,490	15	29,490	15	...	...	...	5,010	15	14,670	15
26,401	3	26,401	3	40	1	·15	996	5	1,598	2
17,757	...	17,757	...	...	...	...	...	...	...	...
5,961	...	5,961	...	...	...	...	...	...	...	...
6,374	...	6,374	...	...	...	...	...	...	...	...
14,252	3	14,252	...	...	...	...	652	3	1,296	1
12,233	...	12,233	...	...	...	...	149	1	149	...
2,516	...	2,516	...	...	...	...	...	...	...	...
1,331	...	1,331	...	...	...	...	...	...	...	...
1,696	...	1,696	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...
176,913	44	175,884	49	1,029	8	..	12,240	41	31,333	31

XII — Percentage of quantity available for impounding to total flow at Kannambadi	Percentage of quantity impounded to total flow at Kannambadi	Quantity available for impounding	Total draw-off including evaporation power	Case applied	Shortage in irrigation supply	Surplus at Kannambadi after satisfying Madras conditions
1	2	3	4	5	6	7
46·65	2·22	78,857	80,855	E	3,530	41,960

XI — ·6 and ·4 Mysore system with compensation: Actual flow up to 1,966 m.c.ft.	Number of days of impounding	Deficit up to 1,966 m.c.ft.: Quantity	Deficit up to 1,966 m.c.ft.: Number of days	Percentage of column 15 on column 2	Useful surplus up to 2,300 m.c.ft.: Quantity	Useful surplus up to 2,300 m.c.ft.: Number of days beyond 1,966 m.c.ft.	Useful surplus up to 2,911 m.c.ft.: Quantity	Useful surplus up to 2,911 m.c.ft.: Number of days beyond 2,300 m.c.ft.
13	14	15	16	17	18	19	20	21
a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*k*
2,382	...	...	...	...	...	...	...	...
5,270	...	...	...	...	...	...	...	...
20,676	9	291	2	1·3	1,000	5	1,505	1
28,601	16	1,603	4	5·3	4,008	12	11,219	12
29,490	15	...	...	...	5,010	15	14,670	15
26,111	3	...	...	...	996	5	1,502	2
17,757	...	...	...	...	...	...	...	...
5,961	...	...	...	...	...	...	...	...
6,374	...	...	...	...	...	...	...	...
11,252	...	...	...	...	652	3	1,296	1
12,233	...	...	...	...	149	1	149	...
2,516	...	...	...	...	...	...	...	...
1,331	...	...	...	...	...	...	...	...
1,696	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...
175,019	43	1,894	6	...	11,815	41	30,341	31

XI — Percentage of quantity available for impounding to total flow at Kannambadi	Percentage of quantity impounded to total flow at Kannambadi	Quantity available for impounding	Total draw-off including evaporation power	Case applied	Shortage in irrigation supply	Surplus at Kannambadi after satisfying Madras conditions
1	2	3	4	5	6	7
67·8	22·77	114,648	31,292	E	3,486	70,967

My. 21 H — ·625 and ·3 Mysore system without compensation: Actual flow up to 1,966 m.c.ft.	Number of days of impounding	Deficit up to 1,966 m.c.ft.: Quantity	Deficit up to 1,966 m.c.ft.: Number of days	Percentage of column 21 on column 2	Useful surplus up to 2,300 m.c.ft.: Quantity	Useful surplus up to 2,300 m.c.ft.: Number of days beyond 1,966 m.c.ft.	Useful surplus up to 2,911 m.c.ft.: Quantity	Useful surplus up to 2,911 m.c.ft.: Number of days beyond 2,300 m.c.ft.
22	23	24	25	26	27	28	29	30
a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*k*
2,382	...	...	...	...	...	...	...	...
5,270	...	...	...	...	...	...	...	...
18,915	7	2,052	3	9·79	892	4	1,337	1
28,892	16	1,312	4	4·34	3,776	12	10,549	11
29,490	15	...	...	...	5,010	15	14,670	15
26,326	3	18	1	·07	996	5	1,540	2
17,757	...	...	...	...	...	...	...	...
5,961	...	...	...	...	...	...	...	...
6,374	...	...	...	...	...	...	...	...
11,252	2	...	...	...	509	3	1,153	1
12,150	2	83	1	·68	119	1	119	...
2,516	...	...	...	...	2,516	...	...	...
1,331	...	...	...	...	1,331	...	...	...
1,696	...	...	...	...	1,696	...	...	...
...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...
173,448	45	3,465	9	...	16,618	40	29,368	30

My. 21 H — Percentage of quantity available for impounding to total flow at Kannambadi	Percentage of quantity impounded to total flow at Kannambadi	Quantity available for impounding	Total draw-off including evaporation power	Case applied	Shortage in irrigation supply	Surplus at Kannambadi after satisfying Madras conditions
1	2	3	4	5	6	7
66·9	22·8	118,180	30,577	E	3,542	70,970

X — ·65 and ·425 Proportionate system or third system: Actual flow up to 1,966 m.c.ft.	Number of days of impounding	Deficit up to 1,966 m.c.ft.: Quantity	Deficit up to 1,966 m.c.ft.: Number of days	Percentage of column 33 on column 2	Useful surplus up to 2,300 m.c.ft.: Quantity	Useful surplus up to 2,300 m.c.ft.: Number of days beyond 1,966 m.c.ft.	Useful surplus up to 2,911 m.c.ft.: Quantity	Useful surplus up to 2,911 m.c.ft.: Number of days beyond 2,300 m.c.ft.
31	32	33	34	35	36	37	38	39
a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*k*
2,382	...	...	...	...	...	...	...	...
5,270	...	...	...	...	...	...	...	...
20,692	7	275	1	1·31	1,803	5	3,268	...
29,915	15	289	3	·96	3,906	11	10,811	...
29,490	15	...	...	...	5,010	15	14,670	...
26,111	2	...	...	...	999	2	1,715	...
17,757	...	...	...	...	...	...	...	...
5,961	...	...	...	...	...	...	...	...
6,374	...	...	...	...	...	...	...	...
14,252	3	...	...	...	652	1	1,296	...
12,233	1	...	...	...	149	...	149	...
2,516	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...

X — Percentage of quantity available for impounding to total flow at Kannambadi	Percentage of quantity impounded to total flow at Kannambadi	Quantity available for impounding	Total draw-off including evaporation power	Case applied	Shortage in irrigation supply	Surplus at Kannambadi after satisfying Madras conditions
1	2	3	4	5	6	7
11·2	22·45	71,791	30,738	D	3,530	36,839

XI — ·7 and ·15 Mysore system with compensation: Actual flow up to 1,966 m.c.ft.	Number of days of impounding	Deficit up to 1,966 m.c.ft.: Quantity	Deficit up to 1,966 m.c.ft.: Number of days	Percentage of column 42 on column 2	Useful surplus up to 2,300 m.c.ft.: Quantity	Useful surplus up to 2,300 m.c.ft.: Number of days beyond 1,966 m.c.ft.	Useful surplus up to 2,911 m.c.ft.: Quantity	Useful surplus up to 2,911 m.c.ft.: Number of days beyond 2,300 m.c.ft.	Supply as per Metur Project	Remarks
40	41	42	43	44	45	46	47	48	49	50
a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*k*		
2,382	...	...	...	...	...	...	...	...	3,105	
5,270	...	...	...	...	...	...	...	...	3,105	
20,110	7	135	1	2·07	1,560	5	2,313	3	35,110	
30,143	12	132	2	·60	4,138	13	11,167	12	36,000	
29,490	15	183	...	...	5,010	15	14,670	15	37,500	
26,111	1	...	...	...	996	5	1,748	2	37,500	
17,757	...	...	...	...	...	...	...	...	32,305	
5,961	...	...	...	...	...	...	...	...	13,215	
6,374	...	...	...	...	...	...	...	...	14,925	
14,252	...	...	...	...	652	3	1,296	1	9,384	
12,233	...	...	...	...	149	1	149	...	7,500	
2,516	...	...	...	...	...	...	...	...	7,500	
...	...	...	...	...	...	...	...	...	5,140	
...	...	...	...	...	...	...	...	...	1,992	
...	...	...	...	...	...	...	...	...	1,890	
...	...	...	...	...	...	...	...	...	...	
...	...	...	...	...	...	...	...	...	190,481	

IX — Percentage of quantity available for impounding to total flow at Kannambadi	Percentage of quantity impounded to total flow at Kannambadi	Quantity available for impounding	Total draw-off including evaporation power	Case applied	Shortage in irrigation supply	Surplus at Kannambadi after satisfying Madras conditions
1	2	3	4	5	6	7
62·8	22·55	166,128	31,199	E	3,530	66,049

Exhibit Ma. 26.

Notes on the yield of the combined Kannambadi and Kabbini catchments, dated 9th April 1914.

THIRD ISSUE.

This note gives additional *data* supplementing those given by Mysore, My. 22, paragraphs 10 to 13, and data which, it is submitted, are far more reliable.

2. The Mysore data are based on percentages of yield obtained from assumed run-noff factors from *average rainfall* recorded in various areas and, *even if the assumptions made could be regarded as correct*, only give an *average*.

As the percentage of run off realised is by no means in proportion to the rainfall but diminishes much more in proportion than the rainfall, as this decreases, the yield is proportionately larger in years of good rainfall and *vice versa*.

3. In the plains part of the catchment rainfall is very precarious especially in the south-west monsoon and in bad years, such as, 1899, 1904 and 1905, the whole yield of the catchment in the south-west monsoon comes from the hill catchments.

Calculations on a percentage basis between the yield of the plains and the hills is altogether misleading and faulty and figures based on average rainfall and resulting "run-off" are of no value compared with even the roughest gaugings and resulting computations.

4. The yield of the Arkavati and Shimsha is suggested by Mysore, My. 22, paragraph 11, to be in the south-west monsoon one-fifth of the yield of the whole catchment between Kannambadi and the Metur site and this is taken from a computation which assumes a run-off factor and applies that to *average rainfall*. In years such as 1899, 1904 and 1905 the yield of such catchments is quite insufficient to replace the losses in transmission from evaporation and percolation only.

5. The statement is fully proved by the result of the actual gauging of last August and September at Danakere, when during the south-west monsoon of 1913 the flow at Sivasamudram was gauged and is compared with the corresponding flow at Bhavani bridge – *vide* Madras Appendix X. This shows not only that there was no inflow gain from the catchment between Sivasamudram and Bhavani but that, throughout the period of 21 consecutive days, 29th August to 18th September, there was a total loss of 15·2 per cent. and between Sivasamudram and the Upper Anicut a loss of 14·4 per cent. The latter includes draw off for the Cauvery channels.

This is typical of the bad years during the south-west monsoon and absolutely proves that the yield of the plains catchment is negligible under such conditions.

6. In the north-east monsoon the precipitation of rainfall in the plains gradually increases from Mysore downwards to the sea and is a more material factor to the river flow than in the south-west monsoon, especially in the lower part of the catchment.

In years of failure of the monsoon, however, the rainfall from this source is fitful and frequently for a month together will be so small as to give no run off affecting the Cauvery.

7. The computations based on assumed factors and percentages applied to rainfall over catchment areas to give totals of monsoon run-off are useless for purposes of studying the half-monthly yields in bad years, and this is what is required. Even applied to total monsoon yield such computations can only be considered where no more reliable data are available and even then only regarded with great suspicion and used with the admission that they are likely to prove altogether fallacious and misleading.

8. In this case there is no reason whatever to resort to such a method of computation as daily gauge-readings are available at Sivasamudram for the years 1902 to 1908 and while the graduation of the Sivasamudram gauge is admitted to be faulty the discharges obtained from the daily gauge-readings by applying suitable corrections will give a measure within reasonable limits of the actual half-monthly flow recorded in the years 1902 to 1908. Not only are the results so obtained infinitely more accurate than those on the basis of rainfall and run-off factors applied to catchment areas but the results give half-monthly yields and it is half-monthly yields in bad years which vitally affect the interests of Madras irrigation.

9 To proceed to examine, by the method indicated above, the yield of the Kabbini, this may, when considering bad years, be considered to be equivalent to the yield at Sivasamudram less the yield of the Kannambadi catchment.

10. On this basis a calculation of the yield of the Kabbini has been made half-monthly by means of the available daily flow at Kannambadi and at Sivasamudram.

For the latter, gauge-readings are available for the years 1902 to 1908 and the calculation has been made for these years on the basis of these. To correct the flow at Sivasamudram from the flow recorded by Mysore, the following corrections have been applied :—

(*a*) The flow on any day within the limits of the approved curve drawn from the Danakere gaugings of last August and September between limits ½ a foot and 3½ feet over Sivasamudram main anicut has been taken from this curve.

(*b*) Flow below this, that is, from 0·5 foot over the anicut downwards from the tables already agreed on as being a fair measure of flow for very low stages.

(*c*) For flow above the stage of (1), either the recorded flow at Sivasamudram on Mysore figures less 10 *per cent* or the flow one day later at Bhavani bridge, *whichever is less.*

(*d*) The time of transmission from Kannambadi to Sivasamudram is taken as one day and from Sivasamudram to Cauvery Dam as three days.

The curve of discharges from the Danakere observations is roughly 10 *per cent* less than the record of Mysore discharges and this is the basis of the above 10 *per cent* less. The high stages at Bhavani bridge are possibly somewhat under-estimated, while those at Sivasamudram are over-estimated. The alternatives given under this avoid chances of any very great error. By means of these figures we can obtain a fair estimate of the half-monthly yield of the Kabbini.

11. From these half-monthly total discharges tables have been drawn showing--

(1) The flow of Agunda Cauvery every half-month and the corresponding flow of the Cauvery at Kannambadi and of the Kabbini and catchment intercepted between Kannambadi and Sivasamudram (columns 1, 2 and 4).

(2) The proportions half-monthly represented by the following :—

		Column
(a)	$\frac{\text{Flow at Kannambadi}}{\text{Flow at Cauvery Dam}}$	3
(b)	$\frac{\text{Flow of the Kabbini and intermediate catchment above Sivasamudram}}{\text{Flow at Cauvery Dam}}$ ...	5
(c)	$\frac{\text{Flow at Sivasamudram}}{\text{Flow at Cauvery Dam}}$	6

It will be evident that the proportions in column 6 are the essentials to be considered in fixing the proportion figure for the proportionate system applied to the Kabbani catchment in combination with the catchment above Kannambadi.

12. As emphasised in the Madras representation (Ma. 24), it is to the distribution of flow half-month by half-month rather than to the total flow of a year or of a whole monsoon that reference must be made in order to judge what proportion factor is required to protect Madras and it is with reference to the bad years 1904-05, 1905-06 and 1908-09 that special attention must be given.

This is so first because the bad years are those in which any deprivation of water is most felt and secondly because it is in these bad years that the lower catchments in the plains fail to give anything like their normal yield. Attention

is therefore specially invited to the half-monthly variations in column 6 of the attached statements in the years 1904-05, 1905-06 and 1908-09.

To make the statements more complete, totals have been made for the south-west and north-east monsoons, but it is urged that it is rather on the half-monthly proportions required to protect Madras that attention should be concentrated, especially for the months of July to November which are the most crucial and important months of the Madras irrigation season.

13. *First taking the south-west monsoon* months of July, August and September—

For the year 1904 the proportion for the second half of August is 1·02 and for all September 1·20 or over.

For the year 1905, for four successive half-months, 1st August to 30th September, the proportion exceeds 1·1 throughout the period and rises as high as 1·21 in the second half of August.

For the year 1908, the proportions are smaller but are as high as ·93 and ·94 for two half-months, and average 0·89 for the whole south-west monsoon.

In the face of this, the factor proposed by Mysore 0·75 (Ma. 22, paragraph 37) cannot be seriously considered. It will be seen that in only one year, 1903-04, which was a year of superabundant river discharge, does the proportion for the whole south-west monsoon fall as low as ·75, while the proportion of the three bad years is :—

Year.	Proportion.
1904-05	0·83
1905-06	1·00
1908-09	0·89

It is not, however, to the total flow of the whole monsoon that attention is to be given, but to incidence of half-monthly distribution of flow, and to secure Madras as regards half-monthly flow a materially higher factor would obviously be necessary.

A consideration of the actual gaugings at Danakere of last September is alone ample proof of the above contention.

14. *Considering the north-east monsoon.*—The months of October and November are the important months of this period in considering the effect on Madras supplies of the Mysore proposed works.

Concentrating attention on these months in the bad years, it will be seen.

1904-1905. The proportion never falls below 0·73 and it is 1·18 for the first half of October and 0·90 for the second half of November. It is 0·95 for the whole north-east monsoon.

1905-1906. The proportion falls as low as ·32 and ·33 in two half-months; but for the consecutive months, 16th October to 15th November, it is 0·66 and 0·59. For the whole north-east monsoon it is 0·58.

1908-1909. The proportion for the first half of October is 0·79 and the second half of November 0·64. For the whole north-east monsoon the proportion is low, *viz.*, 0·325.

It will be seen from the above that the factor proposed by Mysore, My. 22, paragraph 37 (iii), *viz.*, of 0·33 for the north-east monsoon, is still further astray than that proposed for the south-west monsoon.

15. With regard to Mysore statement *P* My. 22 (7), check has been made and it is found that the figures in columns 3 and 4 for the south-west monsoon differ from the figures computed by Madras to a material extent in the bad year 1905-06 for the month of July. The Madras computations make these figures—

	Percentage
Column 3 (Mysore system)	6·28
in place of Mysore figures	4·33
Column 4	5·03
in place of Mysore figures	3·82

The totals for the south-west monsoon this year—

					Percentage.
Column 3 comes to	...	...	...	...	2·89
in place of Mysore	...	...	...	...	2·1
Column 4 comes to	...	...	...	...	2·18
in place of Mysore	...	...	...	...	1·71

For other years some errors have been found, but they are not material in bad years.

If the Assessor or Arbitrator is basing conclusions on statement *P*, the matter should, it is submitted, be further examined; but if it is considered immaterial, no further examination of this is asked for.

16. With regard to the Mysore replies to the Madras Note, Ma. 25, two replies have been received:—

My. 23.—The first on the date on which it was promised, *viz.*, 6th April 1914, received with letter No. 165 of 5th April 1914.

My. 24.—The second on the following day received with letter No. 3279 of 6th April 1914.

17. The Government of Madras do not propose to repeat their arguments and contentions and are content to leave the Mysore representations to the consideration of the Arbitration Committee.

18. With regard to the table accompanying My. 23, it is pointed out that the figures as regards the flow at Cauvery Dam are purely hypothetical and are not borne out by the actual record of flow.

The proportions of yield of the lower catchment in high floods is small in the south-west monsoon as compared with that of the Kannambadi catchment and an examination of the working tables for periods of floods giving flow at Kannambadi from 5,000 to 8,000 million cubic feet per day will show that the corresponding yield at the Cauvery Dam is far smaller in the south-west monsoon than is computed by Mysore.

On the other hand, the figures in the Madras statement Ma. 25, paragraph 24, are not hypothetical but represent and compare actual conditions which must occur under the application of the Mysore and the proportionate systems.

19. With regard to the second note (My. 24) received a day late with letter No. 3279, dated 6th April 1914, the full examination of tables and analysis of this mass of figures received so late has been found impossible in the time available.

The tables are elaborate and require careful check and this is proceeding.

If Madras find it necessary to comment on these tables after time to permit examination is allowed, the right to do so is claimed, but at this stage it is not proposed to offer any remarks on these tables.

20. As regards the rest of the note, Mysore suggest that the tables (*a*), (*b*) and (*c*) accompanying Madras Ma. 25 are on a wrong principle and do not require further notice. The tables and abstracts were prepared at the express request of the Assessor in amplification of those previously prepared and put in with Ma. 24 and it is submitted they are worthy of full consideration.

The statements do not review the effect on Mysore of the application of the systems which are under consideration as the Government of Madras hold that the issue is by what system of measurement and regulation can the prescriptive rights of Madras under the award on the second issue be fully protected.

It is submitted that it is after, and only after, this condition is complied with, that the rights of Mysore to impound water come into existence.

21. Finally, it is put on record that the Madras Government recognise that at this stage of proceedings long discussions, repetitions of arguments and contentions are not called for and that what is required is to place before the Arbitration Committee the best available facts and tables as regards water-supplies and yield of catchments, and they have therefore confined themselves to this.

They do not repeat but do adhere to their already recorded assertions to which they refer the Arbitration Committee.

5

22. The fact that Madras do not reply to the contentions advanced by Mysore My. 23 and My. 24 is not to be taken as any admission that these are accepted but merely that they adhere to their previous attitude and leave the matter in the hands of the Arbitrator.

W. M. ELLIS, COL., R.E.,
Madras Representative.

9th April 1914.

Enclosures.

Exhibit Ma. 26-(a).

Statement of half-monthly yield of catchments.

Half month	Agunda Cauvery half-monthly yield at Upper Anicut	Yield of Kannambadi catchment	Column 2 / Column 1	Yield of catchment below Kannambadi and above Sivasamudram	Column 4 / Column 1	Column 3 + Column 5
	1	2	3	4	5	6
1902-03.						
June, I ...	3,568	1,260	0·38	*Nil.*	.....	·35
,, II ...	8,544	9,030	1·06	2,597	·30	1·36
July, I ...	17,993	11,092	0·62	4,744	·27	·89
,, II ...	98,076	70,784	0·72	15,419	·16	·88
August, I ...	24,929	11,343	0·45	8,062	·32	·77
,, II ...	10,876	8,450	0·78	497	·05	·83
Semptember, I ...	41,681	27,055	0·65	3,064	·07	·72
,, II ...	24,895	14,424	0·58	7,496	·30	·88
Total ...	230,562	153,443	0·67	41,879	·18	·85
October, I ...	21,903	4,605	0·21	1,709	·08	·29
,, II ...	34,244	6,203	0·18	3,372	·09	·27
November, I ...	26,978	6,024	0·22	3,713	·14	·36
,, II ...	14,475	1,516	0·10	1,238	·09	·19
December, I ...	52,705	15,290	0·29	*Nil.*	.....	·29
,, II ...	19,579	4,396	0·22	2,497	·13	·35
January, I ...	6,550	1,637	0·25	*Nil.*	.....	·25
,, II ...	5,536	987	0·18	*Nil.*	.....	·18
Total ...	181,970	40,658	0·22	12,529	·07	·29
1903-04.						
June, I ...	5,786	4,337	·75	*Nil.*	.....	·75
,, II ...	9,558	4,169	·43	3,240	·34	·77
July, I ...	8,337	2,739	·33	*Nil.*	.....	·33
,, II ...	135,223	58,583	·43	12,761	·09	·52
August, I ...	103,488	61,486	·59	51,270	·49	1·08
,, II ...	38,847	21,918	·56	7,733	·20	·76
September, I ...	31,158	13,446	·43	5,178	·17	·60
,, II ...	45,862	10,791	·23	8,381	·18	·41
Total ...	378,259	177,469	·47	88,563	·23	·70
October, I ...	65,007	15,839	·24	12,827	·19	·43
,, II ...	56,746	11,858	·21	9,928	·18	·39
November, I ...	65,966	7,798	·12	3,178	·05	·17
,, II ...	62,037	15,104	·24	27,628	·44	·68
December, I ...	46,941	10,766	·23	2,291	·05	·28
,, II ...	11,492	3,061	27	2,101	·02	·29
January, I ...	10,308	2,039	·20	911	·09	·29
,, II ...	3,808	1,175	·31	897	·24	·55
Total ...	322,305	67,640	·21	60,364	·19	·40

1

Exhibit Ma. 27.

Madras Further Reply—Third Issue.

1. The tables accompanying My. 24 which were received by Madras on the 7th April have now been checked and examined.

A few errors of which the more material are noted in the list of corrections noted below have been found on check, but these are not of so material a nature as to place a different aspect on the results displayed in the tables.

2. It has always been recognised that the operation of the Mysore system was materially more favourable to Mysore than the proportionate system, and under an award on the second issue which contemplated and provided for the full protection and safeguarding of Madras interests and rights within the *limit flow*, and without any dependence on surplus flow, the objections which Madras urge against the adoption of this system would be of much less vital importance than they are. It is denied that the character of the award on the second issue has no bearing on the consideration of the third.

3. It is not suggested that in giving the award on the second issue the Arbitrator had any intention of prejudging or forecasting the nature of the award on the third issue but it is clear from the considerations put forward in the "Examination of Evidence" and on the finding that in framing the award that the principles enunciated in the Assessor's "Examination of Evidence" (paragraphs 99 to 103, 165-A, 173 and 174) were in contemplation and such replenishments as were contemplated form an integral part of the water required to protect and preserve Madras rights and it is submitted that they can only be given in anything approching sufficient quantities under the "Proportionate System".

That the 6½ feet limit is noti ntended as in itself sufficient to protect Madras rights is clear and it is also clear as stated in Ma. 25, paragraph 4, that the award "specifies a limit volume of water which *assisted and supplemented by a proportion of all excess flow over this limit* will fully protect Madras interests".

4. As stated in Ma. 26, paragraph 20, the first essential in considering the award on the third issue is what *system will fully protect Madras* and it is urged that this is the first point to be considered and not the selection of a system which to the detriment of Madras existing rights will enable Mysore to impound more water.

5. The figures of the Mysore statement are amplified by the figures given in the table below, also extracted from the same Madras and Mysore tables from which the Mysore statements are compiled. This table shows clearly that, while even under the proportionate system the Madras interests under the award on the second issue suffer in comparison to the existing conditions, yet this loss is comparatively small as compared with the losses of useful water suffered under the Mysore system.

The table gives the losses in million of cubic feet suffered yearly in the four bad years under the proportionate and Mysore systems, respectively, as compared with actual recorded flow within the limits named.

2

Table showing in million cubic feet losses within named limits suffered by Madras under the Mysore and proportionate systems as compared with existing conditions of natural flow :—

Year	Mysore system factors 0·625 0·30 Mysore Table	Proportionate system		Limit daily discharge
		Factor 0·65 0·425 Table X	Factor 0·60 0·40 Table XII	
				M.C.Ft.
1899-1900	486	268	475	1,966
1904-1905	4,151	1,406	1,713	
1905-1906	3,103	448	805	
1908-1909	3,165	564	1,029	
1899-1900	910	268	475	2,300
1904-1905	4,820	1,556	2,029	
1905-1906	5,962	1,068	1,625	
1908-1909	5,352	1,177	1,878	
1899-1900	1,712	653	1,127	2,944
1904-1905	5,534	2,789	2,962	
1905-1906	13,014	3,504	4,438	
1908-1909	8,390	2,948	3,989	

6. It will be seen that even within the very restricted award limit Madras suffer materially under the Mysore system in 1904-1905, 1905-1906 and 1908-09.

Under the proportionate system the diminution as compared with natural flow is far less although with the factors examined it still exists; surely, under the very low limit assigned to Madras, full protection of that limit at least is Madras right.

7. Under the higher limit 2,944 million cubic feet, the losses under the Mysore system are very considerable in the years 1905-1906 and 1908-1909. In all the years except 1899 the losses under the Mysore system are materially greater than under the proportionate system.

The same remark applies to the limit 2,300 million cubic feet.

Thus, of the four bad years, the losses of useful water through adoption of the Mysore system is great as compared with the corresponding losses under the proportionate system.

8. The Madras title and right is to be fully protected, that is, that the Madras ryots should not incur more loss under the new conditions than under existing conditions.

In the four bad years under review, it is not open to question that much loss was incurred from deficient supply in 1899-1900.

9. The losses suffered from poor outturn of crop for the years 1904-05, 1905-06 and 1908-09 are in evidence (Table III, Ma. 20).

These figures are abstracted from records compiled year by year and all on record prior to the commencement or contemplation of these proceedings and are the best evidence of outturn of crop.

This table shows clearly that in the ten years period for which records of crop outturn are available, the outturn of these years was very markedly below the outturn of any of the other years of the decennium.

This can best be gauged by comparing the outturn of area of crop of quality 12 annas and upwards in these years with those of the other years of the period. This will be found very markedly below the other years.

Again, comparing the area producing outturn of 2 annas only for these three years, the area is much above those of other years.

10. It is thus not open to question that these losses are due to deficient supply, suffered under natural flow under the rules giving a 7 foot limit gauge. Under the award 6½ feet only is the limit allowed with a proportion of all excess flow. This will not, in the opinion of the Madras Government, fully protect Madras even under the proportionate system. It is shown above that in the bad years the losses due to Mysore system within all limits are greater in these bad years than those due to the proportionate system, and frequently much greater. How then

can the latter system secure Madras rights? Madras have suffered losses in these years from deficient flow and the extra losses to be suffered in future in similar years under an award reducing this flow must be greater and greater the more the flow within useful limits previously available is reduced.

11. The Mysore system reduces the flow greatly as compared with the proportionate system and under this system Madras cannot possibly be protected to the extent contemplated in the award on the second issue, while even this extent of protection must leave Madras with added loss to some extent in the bad years.

12. It is therefore contended that the protection contemplated to be given Madras under the award on the second issue cannot possibly be given by the Mysore system and that the introduction of the system cannot but entail on Madras greatly enhanced losses as compared with those now suffered on account of deficient supplies in bad years. The only system which can give to Madras the supplies of water contemplated in the award under the second issue is the proportionate system and though even this system in the opinion of the Government of Madras will give insufficient supplies, they claim that this system should be adopted as the only one which can possibly give them that protection which was the intention of the award.

13. Finally, if in spite of the above contentions the Arbitrator considers that he is unable to accede to the above Madras claim, the Government of Madras while recording their opinion that no other system can possibly safeguard their existing irrigation, elect to accept in alternative the offer made by the Mysore Durbar (My. 22, paragraphs 16 and 17) to accept the proportionate system with a measurement in four places so as to include the Kabbini river with the inflow into the Kannambadi reservoir. The proportion factors under this system would be tentatively fixed by the Arbitrator. The matter has already been discussed in Ma. 25.

This system is fully accepted by Mysore, paragraphs 16 and 17, and again paragraph 37 (iii) and is recognised as being somewhat less harmful to Madras than the Mysore system which under the award on the second issue cannot but fail in very material respects to protect Madras interests.

Correction sheet.

1904-05—
Table IX, col. 47 (*h*).
9,638 should be 2,282.

1905-06—
Table IX, col. 17.
2,858 should be 5,706 and
1,396 should be 4,099.

It is not clearly understood what purpose the abstract statements at bottom of each sheet serve as apparently columns 1 to 3 refer to the period June to January whereas columns 4 and 6 refer to June to May. It is also not understood how column 6 is arrived at with reference to the case applied.

W. M. Ellis, Col., R.E.,
Madras Representative.

11th April 1914.

Exhibit Ma. 28.

Note by the Madras Representative, dated 20th April 1914.

The fourth issue runs as follows:—

"Will the construction and working of the Kannambadi Dam necessarily prevent the passing on to Madras of the quantity of water due to Madras?"

It appears clear that, if the above issue were to be literally construed the answer must be in the negative because the mere existence of the dam would not necessarily prevent the passing on to Madras of the quantity of water due to that Presidency, provided that the dam is worked in accordance with the decisions of the arbitration on the issues 2 and 3. At first sight, therefore, it might appear that no argument or inquiry is required with regard to this issue (4).

2. The Madras Representative, however, is instructed to invite attention to the record of the proceedings of the Arbitrator of the 7th August, which were as follows:—

"Terms of reference discussed.

"As to the suggested terms of reference [item (4)] it is understood that the term of reference set out above will include a full examination of the project from its engineering aspects including controlling agency and other matters relevant to the working of the project."

It is submitted that in view of this record it is not possible to answer the fourth issue by a mere negative. It is essential that in connection with this issue full examination should be made of the water-supplies, draw-off and details of working of the project for the Mysore reservoir and the engineering considerations, controlling agency and other limitations which should be made conditions of giving assent for carrying out the project. It is presumed that in view of what was laid down by the Arbitrator on the 7th of August this contention cannot be questioned.

3. The Madras Government also contend that it is open to them, under this issue, to show that, if the Mysore reservoir is worked in accordance with the findings of the Arbitration Commission under issues 2 and 3, it cannot be successful, that is to say, it cannot be free from liability to frequent failure to irrigate successfully the project areas; and they submit that, if it can be shown that the reservoir will fail to a material extent to irrigate the project areas successfully, the construction of the reservoir should not be permitted.

4. The view has, however, been orally expressed by the Assessor that so long as rules provide of the passing on to Madras the supplies to which they are entitled, the success or failure of the Mysore project is an immaterial consideration in dealing with this issue.

It seems desirable at this stage to ask the Aribitrator to give a definite ruling on this point.

5. If the Arbitrator holds that success or failure is a material consideration, Madras propose to prepare working tables to show the conditions of working in this respect.

6. If, however, the Arbitrator has doubts on the point or his views are that the point is immaterial, Madras ask that he will consider their further representation on the point and then give a definite ruling before proceeding further.

20th April 1914.

W. M. ELLIS, COL., R.E.,
Madras Reprensentative.

Exhibit Ma. 29.

Representations of Madras that the working conditions and prospects of Mysore reservoir are material to arbitration.

The fourth issue has been framed by the Arbitrator in such terms as to include the widest scope for examination of the conditions of regulation and working of the project including engineering aspects, controlling agency, and other matters relevant to the working of the project.

In the discussion which took place with reference to the suggested terms of reference put forward by Madras and by Mysore, the Arbitrator stated that he thought that there was too much detail in the terms put forward by both, and that the terms should be framed in such a way as to include the widest scope. When the terms of the fourth issue as finally settled were under discussion, the Arbitrator replied in the affirmative to the enquiry of the Madras Representative as to whether he was correct in understanding that this issue was intended to include examination and settlement of the specific items comprised in the suggested fourth issue put forward by Madras and in the representations of the Madras Government regarding the tentative issues first framed.

2. The terms regarding the fourth issue as suggested by Madras were stated as follows:—

"Does the decision as regards the foregoing and other points covered by the Agreement of 1892 justify the continued refusal of Madras to assent to the construction of the reservoir projected by the Mysore Durbar; and, if not, what rules and restrictions as regards measurement of flow, means to ensure and agency to supervise the passing of supplies to Madras, draw-off and area irrigated and other points should be made conditions of giving assent?"

Before fixing the issues the Arbitrator framed "tentative issues" and invited the representations of both Governments on these before finally fixing the issues. The representation of Madras Government read by the Madras Representative at the meeting of 7th August 1913, as regards the fourth issue ran as follows:—

"*Item* 4.— The Government of Madras prefer the more specific statement in item (3) of their suggested statement of issues. They are, however, prepared to accept the form suggested with the exception noted below, if they can be assured that they are correct in understanding that the issue as formulated is designed to cover and ensure a full examination of the water-supplies, draw-off and details of working of the project for a reservoir put forward by the Mysore Durbar, and decisions on the engineering considerations, controlling agency and other limitations which should be made conditions of giving assent to the proposed constructions if it is decided that assent should not be withheld.

The Government of Madras object to the last four words of the item."

The assurance asked was given by the Arbitrator and the last four words objected to by Madras were deleted, and the representation of the Government of Madras having been thus fully acceded to, the written statement read by the Madras Representative was not formally put in.

3. The object of the examination of the working conditions is to afford the Arbitrator means of judging whether under the conditions of regulating and impounding, which must be imposed on Mysore in order to fully safeguard Madras, the Mysore reservoir can be successfully worked, that is, whether the prospects of success of the project are reasonably assured.

4. The Madras Government have refused to assent to the proposed construction partly on the ground that the Mysore project would be subject to frequent minor failures and occasional serious failures if the water required to fully secure Madras were passed down to Madras through the Mysore reservoir.

The conditions and situation of the Mysore reservoir are such as to make it possible to lessen or altogether avert failures by omission to pass to Madras the full quantities of water to which they are entitled.

5. The Madras Government have no desire to hinder in any way legitimate expansion of irrigation by Mysore, and have actually assented to the construction of a reservoir on the Cauvery, and extension of irrigation within named limits, because, subject to restrictions as regards impounding which would safeguard the existing Madras rights the prospects of success of such a project are well assured.

In the case of the larger reservoir project now under consideration, this is believed not to be the case, and that this project can only successfully pass in bad years the supplies for Mysore irrigation and power which constitute the project scheme of working if the supplies to which Madras have title are encroached upon and utilised for Mysore irrigation.

6. The state of affairs may be described in general terms as follows:—

The Mysore reservoir dam is proposed to be built across the Cauvery at a place which intercepts a large proportion of the water giving supply to existing Madras irrigation.

For the supply of this irrigation Madras has prior right to all natural flow up to a certain stage of flow, while any excess flow over, this may legitimately be retained and impounded in Mysore reservoir, and used for the supply of any irrigation in Mysore dependent, directly or indirectly, on the new reservoir.

The whole of the supplies of the river from above the dam site, to which Madras are entitled, must pass through the Mysore reservoir, and these supplies are dependent on the regulation of the water and issues through the dam sluices. If the conditions of working, as examined on the best available data in the form of working tables for a considerable series of years, show that, under such regulation as will give to Madras the supplies to which they are entitled, the Mysore reservoir can successfully and without serious failure supply the water to the new irrigation in Mysore which is required under the proposals constituting the project, the scheme would appear feasible and, so far as reasonable forecast can determine, would have assurance of being successfully operated. To such a project Madras has no opposition to offer. If, however, the working tables show that there is liability to occasional disastrous failure, and frequent minor failures occur, unless the supplies to which Madras is entitled are intercepted then it is submitted that the Madras interests will be exposed to grave danger.

7. It is believed that the Mysore Durbar is not fully advised of the real prospects of this project which Madras believe to be most unfavourable.

There is good reason to believe that the Durbar's Engineers had not (up to the time of the arbitration commencing) prepared tables based on daily discharges past the dam site, which basis is the only one on which an accurate forecast of working conditions can be made, for in reply to a request for a statement of daily observed or computed flow past Kannambadi, the Mysore Representative stated that no such information is forthcoming and that only half-monthly flow has been computed. As working conditions must be regulated on a basis of daily (or more frequently measured) incidence of natural flow, it is obvious that this statement involves the admission that no working tables based on daily incidence of flow were prepared prior to the sitting of the Arbitration Committee.

8. It might be urged that the failure or success of Mysore project is not a matter with which Madras has concern. If the success or failure of any year were inevitable and beyond control this would be so, but when failure is altogether due to passing down to Madras water which might be impounded and run on to Mysore fields the case assumes an altogether different aspect. Add to this, the belief which nothing will eradicate, of all the local population probably including the subordinates operating the sluices, that the water is passed to Madras through an unjust exercise of power by the Supreme Government and a critical condition of affairs is at once established. Picture the conditions of affairs when the Mysore fields are withering from want of water, while large supplies, possibly full supplies, are being passed down to Madras. Consider that the operating staff are probably in sympathy with the suffering ryots and convinced that great injustice is being perpetrated

in favour of Madras; realise further that this staff is likely to be subjected to great temptation to tamper with regulation in favour of the local authorities; consider also that control and regulation is to be affected by the manipulation of a large number of sluice gates twice, or oftener in each 24 hours, that a small alteration in the adjustment of these sluices may, under certain conditions, make very material difference in the water passed and it cannot but be recognised that without for a moment questioning the *bona fides* of the Mysore Government or their superior officers that there are grave risks to Madras interests involved whenever short supplies are being passed to Mysore ryots.

Consider further that by occasionally altering for a few hours at night the regulation of the sluices considerable extra supplies could be passed to Mysore ryots by connivance of the subordinate staff, while the risk of discovering of such proceeding is likely to be small.

9. Realise again that faulty regulation by not carrying out exactly orders as to the amount of opening of sluices is easy to effect, involves no risk and will probably not be detected if the controlling officers are other than *very* vigilant and *always* vigilant. Under the circumstances, can any one say that Madras is not subject to risk, and risk of a grave nature, on occasions when the Mysore lands are suffering badly from want of water? The risk is intensified in proportion as this condition is more or less frequent.

10. Even if the examination of working conditions showed that the Mysore project could be worked successfully within the limits of "draw-off" proposed, Madras would still be subjected to some risk, on account of the very natural sympathies of the local staff with the local ryots and cultivators in whose neighbourhood they live and tending towards taking minor advantages in favour of Mysore. Under conditions involving failure of supply, the risk always present becomes immensely intensified.

11. The refusal of assent of Madras to a project on the lines drawn up by Mysore, if such a project is shown to have no reasonable prospect of success, is thus "for protection of the prescriptive rights of Madras already acquired and actually existing."

12. The Government of Madras urge most strongly that the risk to their rights under condition involving frequent minor, and occasional serious, failure to give adequate supplies to Mysore irrigation will be real and that Government represent that they are justified under such circumstances in refusing assent to the scheme.

In making this representation, the Government of Madras wish to be distinctly understood that they do not question the absolute *bona fides* of the Mysore Government in the matter and here state that similar opposition would be made to a similar project by Bombay, Bengal or any other Government.

13. It is represented that it is to just such a case as the present that the Agreement of Mysore and Madras has reference.

14. The implied intention of the Agreement is that Madras are justified in refusing assent to any reservoir project of Mysore which cannot be shown to have well assured prospects of success when accompanied with such restrictions on impounding as will fully safeguard Madras existing rights. Failing this intention, it is asked why is the power of refusal of assent given to Madras? It is clear that the construction of such a reservoir by itself unless coupled with the intention of impounding or diverting water cannot injure Madras and yet it is the *construction*, and not merely the *regulation for impounding* which is under the Agreement with Mysore subject to veto by Madras. Were the considerations of the practical working conditions of any project intended to be eliminated, the Agreement would only have given the power of refusal of assent *to the system, and rules of regulation* and left Mysore free to construct, *subject to approved rules*, any reservoir on however unsound a basis as regards prospect of material success.

15. Again, once it is admitted that the prospects of the Mysore project are far from well assured, this undoubtedly greatly increases the risk of injury to Madras while it diminishes, and indeed altogether removes, any reasonable cause of grievance from Mysore State.

It certainly is not the intention of Mysore Durbar to launch out into vast unproductive expenditure on such a project, and while refusal of assent to a project, of which success is well assured, on the ground of the ever present risk to Madras interests would entail a legitimate grievance, refusal of assent to an unsound project on such a ground cannot but be a benefit to both States.

16. It is not reasonable to suppose that the officers who are responsible for drawing up this project admit that its prospects are anything but assured, and it is believed that the Durbar believe them to be so relyingon the assurances of their Engineers; but contrary to the usual custom in the case of large Engineering projects of such a nature the project has not been subjected to criticism, or expert examination by any high authority, other than that of the officer responsible for drawing it up.

Every engineer is likely to be unconsciously prejudiced in favour of his own projects and in the case of large irrigation projects the extent to which such bias may carry the most careful conscientious and able engineers is a matter of common knowledge. In the Madras Presidency the necessity for submitting large projects for independent scrutiny has undoubtedly saved the unproductive expenditure of very large sums, and it is strange if conditions are very different in Mysore. This project is believed by the Mysore Government to have assured prospects of success, on the authority of the reports of the officers who prepared it, and these officers have certainly taken most optimistic views on flimsy evidence on vital points (*e.g.*, amount of yield of catchments, amount of silt deposited, effect of undersluices in removal of silt).

Under the circumstances, it is no wonder that the Mysore Durbar, believing that their proposals are altogether sound, should look on Madras opposition as unjustifiable and based on extravagant claims.

The fullest examination of the Mysore project water-supplies is pressed for and it is urged that assent should only be given to a project which has good prospect of success, after allowing for passing on whatever supplies of water are judged to be required to fully safeguard Madras.

17. Throughout the controversy preceding this arbitration the attitude of the Government of Madras in regard to the Mysore project has been the examination of the prospects of successful operation of the project, under such condition as involved passing to Madras of the water to which it was claimed Madras had prior right and under the assumption the success was an essential to procure Madras consent.

It was clear from the first that if successful operation of the Mysore project were not a consideration this view was untenable, but the natural attitude was taken up that it was within the rights of Madras to refuse assent to any project proposed by Mysore which could only be successful if the supplies to which Madras had right were diverted from Madras to the use of Mysore.

This attitude has from the first been fully accepted by the Government of India and is a reasonable and logical one. It may be conceded that the information as regards supplies due to Madras, which were available for examination by Sir John Benton, was incomplete, and that some of the figures were inaccurate, and that this may, as represented in the Assessor's Examination of Evidence, have affected his opining on the matter of supplies due to Madras; but, on the final issue as to whether Madras were justified in refusal of assent on the ground of failure of Mysore reservoir as demonstrated in the working tables, this uncertainty does not operate. Not only did Sir John Benton take the view that failure of the Mysore project as regards prospect of well-secured success justified the Madras refusal, but the Government of India fully supported that opinion and recommended to that Government the enlargement of their proposed reservoir with a view of securing such assurance of success (*vide* Ma. 8, page 32, letter from the Deputy Secretary to the Government of India to Resident, Mysore, No. 1315-I.B. of 26th June 1911 and page 62, letter No. 1824-I.B. of 25th August 1911).

It is thus clear that in the opinion of the Government of India successful operation was to be an essential feature of Mysore project and that failure in this respect justified the Madras Government's action.

This has been throughout and is still the view of the Government of Madras.

18. To sum up, the Government of Madras represent, in consideration of all the above arguments, that if the working prospects of Mysore project are such as to indicate frequent minor and occasional serious failure the project cannot be operated except under conditions of regulation involving to Madras rights constantly recurring risks and that in the protection of such rights they are under the circumstances justified in refusing their assent and that the working conditions of the reservoir as regards prospects of material success in irrigating the areas proposed, is a very material consideration in regard to the finding on the fourth issue.

20th April 1914.

W. M. ELLIS, COL., R.E.,
Madras Representative.

Exhibit Ma. 30.

Representation regarding Arbitrator's finding and award on the issue 3 (a).

In the Arbitrator's finding and award on issue 3 (*a*)*, it is stated that the fourth or modified Madras system was proposed by Mysore "as an alternative in the event of their own system not being adopted."

*Page 2 lines 1 to 2.

2. The Government of Madras instruct me to represent that the Mysore Durbar proposed this system as a free and equal alternative to the adoption of the Mysore system and that the words "in the event of their own system not being adopted" convey that Mysore proposed that the modified Madras system for adoption only in the event of the Mysore system not being found acceptable.

This is not the case as the two systems were advanced by Mysore as acceptable alternatives without any such qualification.

3. The Government of Madras instruct me to request that the record may be so amended as to make this point, which they regard as a very important one, free from any ambiguity or possibility of misunderstanding.

22nd April 1914.

W. M. ELLIS, COL., R.E.,
Madras Representative.

Exhibit Ma. 30-a.

Reference to paragraphs regarding the modified Madras system.

The offer of Mysore expressing willingness to accept the "modified Madras system" was made in My. 22, paragraphs 16, 17 and 37 (3). In the latter Mysore urge that "one of the three alternatives noted below may be finally accepted."

2. In Ma. 27, paragraph 13, the Madras Government state that, if the Arbitrator is unable to accept the third system, they elect in alternative to accept the offer of the modified Madras system with any proportion factors which may be fixed by the Arbitrator adding that the latter have already been dealt with in Ma. 25—this last should be Ma. 26, paragraphs 1 to 14.

3. It is represented that neither when the offer was made nor when Madras accepted this offer as an alternative in default of award of the third system did Mysore make any condition, reservation or qualification with regard to acceptance of this system.

W. M. ELLIS, COL., R.E.,
Madras Representative.

22nd April 1914.

To

The Arbitrator,
Mysore-Madras Cauvery Arbitration.

Sir,

I forward above as requested references to the material paragraphs and matter on which Madras base their statements put forward in Ma. 30 of 22nd April 1914.

I have the honour to be,
Sir,
Your most obedient servant,

22nd April 1914.

W. M. ELLIS, COL., R.E.

A. Ma. 30

Exhibit Ma. 31.

Note on duties Mysore Reservoir.

When the Mysore Representative puts in his statement of "draw-off" proposed for the working tables My. 19 *(a)* it was stated on behalf of Madras that for the purpose of the third issue these "draw-offs" would be adopted for preparing working tables, but that Madras would have a representation to make on this subject with regard to the further issue to be decided.

2. The object of making working tables for the purpose of the fourth issue is to enable as accurate a forecast as possible to be made of the prospects of the Mysore project as regards success or failure and of the probable number of occasions in which the full supplies required for the areas to be irrigated under the project will be deficient and the probable extent of such deficiencies.

3. It is obvious that unless the "draw-offs" allowed in these tables are adequate and suitable for the irrigation of the areas which constitute the project proposals the tables will become not only useless but fallacious and misleading as they will present an altogethar inaccurate forecast of the future propects of the project.

4. The area which is to be irrigated under the Mysore (Kannambadi) project now the subject of this Arbitration is 1,50,000 acres (page 4, paragraph 20) and this area is sub-divided into—

120,000 acres monsoon crop
30,000 acres perennial crop } page 31, note to statement (ii).

The "draw-off" proposed by Mysore for perennial crop and monsoon crop as given in My. 19 *(a)* is tabulated in the attached statement "X" for the different classes of years named in My. 19 *(a)*.

5. Referring to the statement it will be seen that the normal duty in acres per cusec for the perennial crop is 59 acres per cusec day by day throughout the year.

In criticising this figure, it is represented that it is too small a duty to allow of the supply of the perennial crop during the dry months from February to June.

During such time the canals and channels will be carrying much smaller supplies than they are designed to carry with consequent waste, and in addition the rainless season and extreme heat entail great losses. On the other hand, it is considered that the duty is unnecessarily low for the rainy months of September and October and also probably for the months of July, August and November.

Taken as an all round allowance, the Government of Madras consider that it is reasonable and may be accepted as adequate so far as regards the "A" scale of duties.

6. With regard to the duties allowed for the monsoon crop the same cannot be said. The scale of duties allowed are altogether too high to give any prospect whatever of successful realisation and are far higher than any realised in Madras even in the modern systems in Kistna and Godavari deltas in which most of the area irrigated is of an almost in impervious nature and the rainfall is materially higher and the air more charged with moisture than in the inland tracts in which the Mysore area is situated.

7. In making the above and the following remarks reference is only made to "A" scale of duties, that is to the Mysore proposed full supplies. These are very inadequate and this being so, the other scales cannot secure the area of crops proposed to be irrigated and their application must result in deficiencies in area and outturn of crop according to the amount of the deficiency of supply.

8. Below is given a table showing (columns 1 to 4) half monthly the Mysore "A" scale of supplies and duties for monsoon crop with the equivalent depths in inches on the area and also two-thirds of the average rainfall in the area to be irrigated. (Krishnarajpete has been taken as the representative station for rainfall).

9. The same table shows (columns 6 and 7) the lowest duties which in the opinion of the Madras Government are safe to apply for the purpose of working tables for the monsoon crop.

10. It is submitted that it is for the Arbitration Committee to decide what under all considerations of the conditions of the Mysore project are to the duties to be adopted for truly representing the prospects of the Mysore project in preparing working tables.

11. Table of duties—Monsoon crop—

Months	Duties A scale My-19 (*a*)				Duties suggested by Madras		
	Duty acres per cusec	Equivalent depth in inches	Two-thirds average rainfall Krishnarajpete	Total columns 3 and 4	Duty acres per cusec	Equivalent depth in inches	Total depth, column 4 *plus* column 7
1	2	3	4	5	6	7	8
June, 2nd half	100	3·6	0·85	4·45	60	6·0	6·85
July ... 1st half ...	100	3·6	0·66	4·26	60	6·0	6·66
July ... 2nd ,, ...	100	3·85	0·66	4·51	60	6·0	6·66
August ... 1st ,, ...	100	3·6	0·73	4·33	60	6·0	6·73
August ... 2nd ,, ...	100	3·85	0·73	4·58	60	6·0	6·73
September ... 1st ,, ...	100	3·6	2·01	5·61	70	5·2	7·21
September ... 2nd ,, ...	100	3·6	2·01	5·61	70	5·2	7·21
October ... 1st ,, ...	100	3·6	2·23	5·83	75	4·8	7·03
October ... 2nd ,, ...	100	3·85	2·23	6·08	75	4·8	7·03
November ... 1st ,, ...	100	3·6	0·72	4·32	75	4·8	5.52
November ... 2nd ,, ...	100	3·6	0·72	4·32	75	4·8	5·52
December ... 1st ,, ...	150	2·4	0·08	2·48	75	4·8	4·88
December ... 2nd ,, ...	150	2·6	0·08	2·68	100	3·6	3·68
January, 1st half	200	1·8	0·04	1·84	120	2·4	2·44
Total ...	...	47·15	13·75	60·90	...	70·4	84·15

12. In considering this matter, it is most material to enquire what is the present general and accepted practice in Mysore as regards duties allowed for irrigation of rice crops under tanks in the plains. As regards this tank irrigation, there is in Mysore a well-established and definite quantity allowed for irrigating one acre of paddy and so generally is this quantity recognised and adopted that it is known as "a Mysore unit" and quantities of water are worked out in "Mysore units" in the practice of the Mysore irrigation officers. A "Mysore unit" is the water required to be stored to irrigate one acre and amounts to a depth of 72 inches (6 feet), approximately 260,000 cubic feet.

13. It is to be recognised that the soil of Mysore in the tract to be irrigated is of a porous nature while the rainfall is scanty and precarious; the tract is fairly typical of the conditions generally obtainable throughout the "Maidan" parts of Mysore and fairly typical of the conditions to which the "Mysore unit" is applicable.

14. It is now to be considered in what respect the conditions of the project irrigation will differ from the ordinary tank irrigation to which the Mysore unit is applied in ordinary practice as the recognised duty basis for one acre.

The differences are these:—

The unit includes ordinary allowances for percolation and evaporation in tanks while separate allowance is made for this in the Mysore project tables. On the other hand, the area to be irrigated under the tanks is in the immediate vicinity of the tank and the carrying water many miles through canals and distributary channels running in porous soil through an arid country is not required in the case of the tank systems, but it will be in the Mysore project system. Further, the areas

irrigated under tanks are all concentrated and are generally low-lying lands on the margins of the streams across which the tank bund is constructed. These lands are of richer and less porous soil than the average of the lands to be irrigated under the large project. Also, it is part of the project design to scatter the irrigation and only irrigate one-fourth of the area which is commanded and irrigable, and by so doing to avoid the danger of water-logging and the malaria resulting in other parts of Mysore from intensive irrigation (Mysore Project, page 7, paragraph 38).

This entails much expenditure of water and involves low duty figures.

Again the tanks raise their crops in five and a half months whereas, under the project, paddy taking water for seven months is proposed and this entails extra water per acre than the five and half months' crop.

15. It is material to bring to notice the allowances made by Capt. Dawes for the monsoon rice crop under the first Kannambadi Project (Part I, page 18 of Captain Dawes' report).

He says "the total quantity of water which I have allowed for irrigation is as follows:—

For rice one and half units.

For dry crops half unit.

The unit of this State is the amount of water required to cover an acre to a depth of six feet (*viz.*, 72 inches) and is nearly 260,000 cubic feet."

16. Captain Dawes evidently recognised that there were conditions entailing great wastage inherent in the scheme, but he probably over-estimated the amount of this wastage. The scheme involves great losses through the net work of channels and the large area of very porous soil in a very dry country to which the irrigation is to be applied. It is believed that the *lowest reasonable forecast* of possible irrigating duty of water under the Mysore scheme will be found in the basis of the duty figures amounting to one "Mysore unit" for each acre to be irrigated.

This estimate is made setting off the losses from percolation, etc., on the one side against the porous soil scattered irrigation and long period of water-supply on the other.

17. The "Mysore unit" is the basis of the duty figures put forward by Madras which totals to 70·4 inches against 72 inches, the standard of the Mysore unit and it is put forward as the absolute minimum on which reliance can be placed for forecasting the working of the project.. The incidence of half-monthly duties proposed varies with the requirements of the crop and the seasonal rainfall and the table shows the distribution suggested.

18. The duties proposed are as low as are at all likely to be realised in a well-designed modern system in the soil and under the conditions of this project.

They are believed to be higher than have been hitherto realised in any upland system in southern India. In the Kistna and Godavari deltas in which the soil is mostly of an impervious nature (black soil), the country flat and the rainfall materially greater than the Mysore area, the standard allowance on which canals and distributaries are designed is a duty of 70 acres per cusec for transplantation time and an ordinary duty of 90 acres per cusec.

It is submitted that examination of the matter will support the table of duties now put forward for consideration and decision of the Arbitration Committee.

W. M. ELLIS, COL., R.E.,
Madras Representative.

14th April 1914.

Enclosure.—(MYSORE PROPOSED DUTIES.)

Statement of duties and discharge per second during a year for monsoon (120,000 acres) and perennial crops (30,000 acres) as per My. 19 (*a*).

Case or classification	A				B				C				D			
	Monsoon		Perennial		Monsoon		Perennial		Monsoon		Perennial		Monsoon		Perennial	
Months	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
June I	...	...	59	509	...	...	59	509	...	...	59	509	...	...	59	428
,, II	100	1,182	59	509	100	1,182	59	509	100	1,182	59	509	100	1,182	59	509
July to September	100	1,182	59	509	100	1,182	59	509	100	1,182	59	509	100	1,182	59	509
October	100	1,182	59	509	100	1,182	59	509	100	1,183	59	509	100	1,182	59	509
November	100	1,182	59	509	150	799	59	509	200	602	59	509	300	602	90	336
December	150	799	59	509	225	532	59	509	300	393	59	509	300	393	90	336
January I	200	602	59	509	400	301	59	509	400	301	118	255	400	301	118	255
,, II	...	...	59	509	...	...	59	509	...	...	118	255	...	...	118	255
February	...	...	59	509	...	...	59	509	...	...	59	509	...	...	59	428
March	...	...	59	509	...	...	59	509	...	...	59	509	...	...	59	428
April	...	...	59	509	...	...	59	509	...	...	59	509	...	...	59	428
May	...	...	59	509	...	...	59	509	...	...	59	509	...	...	59	428

Months	E				F				G				H			
	Monsoon		Perennial		Monsoon		Perennial		Monsoon		Porennial		Monsoon		Perennial	
	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
June I	...	...	59	255	...	...	59	174	...	...	59	127	...	...	59	127
,, II	100	1,182	59	509	100	1,182	59	509	100	1,182	59	509	100	1,182	59	509
July to September	100	1,182	59	509	100	1,182	59	509	100	1,182	59	509	100	1,182	59	509
October	100	1,182	59	509	100	1,182	59	509	200	502	59	509	200	602	59	509
November	200	602	90	336	200	602	118	255	200	502	118	255	200	602	118	255
December	300	393	90	255	300	393	118	255	300	393	118	255	300	393	118	255
January I	400	301	118	255	400	301	118	255	400	301	118	255	...	...	118	255
,, II	...	...	118	255	...	...	118	255	...	..	118	255	...	...	118	255
February	...	...	59	255	...	...	59	174	...	...	59	127	...	...	59	127
March	...	...	59	255	...	...	59	174	...	...	59	127	...	...	59	127
April	...	...	59	255	...	...	59	174	...	...	59	127	...	...	59	127
May	...	...	59	255	...	...	59	174	...	...	59	127	...	...	59	127

Exhibit My. 25.

In explanation of the draw-off figures given in My. 19 A, it may be stated that the figures represent the average for the whole season in each case.

The total area to be irrigated is about 125,000 acres as given in the project (*vide* paragraph 35, page 7), of which about 40,000 has been assumed as under perennial irrigation (*vide* page 28, paragraph XX).

For the monsoon crop area of 85,000 acres, a draw-off of 103 m.c.ft., generally gives an average duty of 76 against 71 as per data assumed by Madras (*vide* statement attached).

If the irrigation period is taken from 15th June to 15th December only, as would be the case in actual practice, the duty will be $\{\frac{85,000}{1,192}\} = 71$, same as the Madras figures. The provision is made only as a precaution against late sowing in exceptional parts of the irrigated area.

For the perennial area of 40,000 acres, the average draw-off assumed is 44 m.c.ft. which gives an average duty of about 78 for the whole season. Considering that the monsoon duty even according to the Madras data is about 71, the average duty of 78 for perennial crops is by no means high.

KARPUR SHRINIVASRAV,
Mysore Representative.

22nd April 1914.

Enclosure.

COMPARATIVE STATEMENT showing the average duty for monsoon crops.

Period.	As proposed by Madras. Monsoon crop. Duty.	Acres.	Cusecs.	As per Mysore scale A. Cusecs.
June, 2nd half	60	85,000	1,417	
July ... 1st half	60	85,000	1,417	1,192
July ... 2nd „	60	85,000	1,417	1,192
August ... 1st „	60	85,000	1,417	1,192
August ... 2nd „	60	85,000	1,417	1,192
September ... 1st „	70	85,000	1,214	1,192
September ... 2nd „	70	85,000	1,214	1,192
October ... 1st „	75	85,000	1,133	1,192
October ... 2nd „	75	85,000	1,133	1,192
November ... 1st „	75	85,000	1,133	1,192
November ... 2nd „	75	85,000	1,133	1,192
December ... 1st „	75	85,000	1,133	1,192
December ... 2nd „	100	85,000	850	799
January 1st half	120	85,000	708	602
		Total ...	16,736	15,705
		Average ...	1,195	1,122

REMARKS.—(i) Average duty as per Madras data is $\frac{85,000}{1,195} = 71$

(ii) Average by Mysore scale is $\frac{85,000}{1,122} = 76$

Exhibit My. 26.

That the Mysore system alone would give due facilities for impounding in Mysore according to the Agreement of 1892 and that any other system would not be advantageous to Mysore has been stated over and over again in the Mysore case.

2. The disadvantages of the proportionate system and the unwillingness of Mysore to accept the same have been brought to notice on every occasion when this was discussed and pointedly with reference to working tables in My. 21, as summarised in paragraph 23 thereof. In paragraph 24 of the same exhibit, two alternatives both based on Mysore system were suggested for adoption, the first with lower proportions combined with computation of compensation water, and the second with higher proportions without such computation. In paragraph 16, My. 21, it has been clearly shown that the second of these alternatives is less advantageous to Mysore than the first and therefore it was placed second in the order of the alternatives.

3. Madras, in their Ma. 24, depending upon certain passages of the Assessor's examination and the award by the Arbitrator, urged that the award on the second issue was based on the proportionate system of measurement. It was not then clear whether this contention of Madras would be accepted by the Arbitration Committee. In the event of such acceptance, it became necessary for Mysore to consider under what special conditions as a last resort even the generally disadvantageous proportionate system could at all be made acceptable. Therefore the merits of the fourth system, namely, the measurement at the four places on the proportionate method, were discussed in My. 22 as a third alternative to the two proposed in My. 21.

4. But it was distinctly mentioned in paragraph 36 (c), My. 22, that even this method was not altogether free from the disadvantages of the third system. On account of such disadvantages, it was placed last in the order of the alternatives shown in the concluding paragraph 37, My. 22. Of the three alternatives mentioned there, the first two were deliberately repeated in the same order in which they were given in My. 21, paragraph 24, for reasons noted in paragraph 2 above, and the third being based on the proportionate system altogether unacceptable to Mysore, was considered less advantageous than even the second and therefore was placed as the last alternative for acceptance in the event of the first or the second being rejected by the Arbitration Committee. The remarks made in paragraphs 16, 17 and 19 of My. 22 can only be taken in this light and not as placing all the three alternatives on the same level as interpreted by Madras.

5. The reference to alternative system, made by Mysore in their telegram, dated the 18th instant, had in view an option, similar to what was given to Madras in the award on the second issue, after a full consideration of the case by the Arbitration Committee. This cannot be construed as having any special reference to the three alternatives mentioned in paragraph 37, My. 22, for the simple reason that it was open to the Arbitration Committee to accept any of the methods proposed by Madras or Mysore or reject all of them and suggest any method which they considered most suitable. Even supposing for argument that the option referred to the alternatives mentioned by Mysore, the very fact that an option was specially asked for, so that the most advantageous method may be chosen by them, unmistakably indicates that the several alternatives were not considered by Mysore as having the same value, the last alternative being the least advantageous to them as explained.

KARPUR SHRINIVASRAV,
Mysore Representative.

23rd April 1914.

Exhibit My. 27.

Statement of daily draw-off for monsoon and perennial irrigation to be applied for the working tables.

Case	A		B		C		D		E		F		G		H		Remarks
Month	Monsoon	Perennial	Monsoon	Perennial	Monsoon	Perennial	Monsoon	Perennial	Monsoon	Perennial	Monsoon	Perennial	Monsoon	Perennial	Monsoon	Perennial	
October	103	54	103	54	103	54	103	54	103	54	103	54	51·5	54	51·5	54	
November	103	54	69	54	51·5	54	51·5	36	51·5	36	51·5	27	51·5	27	51·5	27	
December	69	54	46	54	34	54	34	36	34	36	34	27	34	27	23	27	
January 1st half ...	51·5	54	26	54	26	27	26	27	26	27	26	27	26	27	...	27	
January 2nd half ...	...	54	...	54	...	27	...	27	...	27	...	27	...	27	...	27	
February	...	54	...	54	...	54	...	45	...	22·5	...	18	...	13·5	...	13·5	
March	...	54	...	54	...	54	...	45	...	22·5	...	18	...	13·5	...	13·5	
April	...	54	...	54	...	54	...	45	...	22·5	...	18	...	13·5	...	13·5	
May	...	54	...	54	...	54	...	45	...	22·5	...	18	...	13·5	...	13·5	
June, 1st half	...	54	...	54	...	54	...	45	...	22·5	...	18	...	13·5	...	13·5	

Class	Storage at the end of October	Storage at the end of September
A	33,500	.....
B	31,500	.....
C	29,500	.....
D	27,500	.....
E	25,500	.....
F	23,600	.....
G	.....	at about 26,500 or less.
H	.....	at about 24,550 or less.

23rd April 1914.

KARPUR SHRINIVASRAV,
Mysore Representative.

Exhibit My. 28.

Mysore Reply to the Madras Exhibits Ma. 28 and Ma. 29.

Madras have put in two statements (Ma. 28 and Ma. 29) as a preliminary to the consideration of the fourth term of reference and they have based their remarks mainly on general considerations and certain unwarranted assumptions. Their arguments may be considered under the following heads:—

(i) The wording and intention of the fourth term of reference.
(ii) Scope of the Agreement of 1892.
(iii) Precautions for protecting Madras rights.
(iv) Certain assumptions of Madras regarding regulating staff.
(v) Sir John Benton's views.

(i) The wording and intention of the fourth term of reference.

2 The fourth issue runs as follows:—" Will the construction and the working of the Kannambadi Dam necessarily prevent the passing on to Madras of the quantity of water due to Madras?"

The correct answer to this issue is indicated by Madras in Ma. 28 in these words:—" If the above issue is to be literally construed, the answer must be in the negative, because the mere existence of the dam would not necessarily prevent the passing on to Madras of the quantity of water due to that Presidency, provided that the dam is worked in accordance with the decisions of the Arbitration on the issues 2 and 3." This is a significant admission by Madras and forms in itself a sufficient reply to both Ma. 28 and Ma. 29. There is no reason why the reservoir should not be worked strictly in accordance with the rules which may be framed and accepted by both parties.

3. In regard to a certain written statement read by the Madras Representative prior to the framing of the issue and referred to in paragraph 2, Ma. 29, the Arbitrator has recorded his opinion thus:—"As to the suggested terms of reference, item 4, it is understood that the term of reference set out above will include a full examination of the project from its engineering aspects including controlling agency and other matters relevant to the working of the project." It has to be noted that the first portion of the statement read out, which refers to "a full examination of the water-supplies, draw-off and details, etc.", has not been included in the proceedings.

4. The saving clause " it is understood", which governs the whole of the opinion of the Arbitrator, clearly indicates that, on account of the insufficient information then available, it was not possible for the Arbitration Committee to decide whether the contention of Madras regarding the examination of the project should be conceded or not. It was therefore natural that the contentious matter in the Madras statement was not included in the wording of the fourth term; the only relevant question raised in it being whether the dam would "necessarily prevent the passing on to Madras of the quantity of water due to Madras."

5. The examination of the materials supplied by both the parties in the course of the Arbitration proceedings afforded ample indication that the claim of Madras for a scrutiny of the project was untenable. It was perhaps for this reason that the Assessor gave expression to the following view referred to by Madras in paragraph 4, Ma. 28:—

"Whether the reservoir can be safely worked or whether the prospects of the success of the project are reasonably assured are matters beyond the realm of Madras objections as long as their prescriptive rights are preserved unimpaired."

(ii) Scope of the Agreement of 1892.

6. Madras contend that " the implied intention of the Agreement of 1892 is that Madras are justified in refusing their assent to any reservoir which cannot be

shown to have well assured prospects of success." Such a claim is not warranted by the Agreement. There is no mention of any such intention in the protracted dicussions that led to the Agreement-*vide* Ma. 11, Appendix A. All that Madras can claim strictly in terms of the Agreement is that the reservoir should not interfere with their prescriptive rights.

7. This is not the first time after the Agreement of 1892 that a large reservoir has been proposed and constructed by Mysore. All that Madras insisted upon when the large Marikanave reservoir was constructed, was the condition that the level of water required for their irrigation at a certain anicut should not be interfered with. Beyond this they did not put forth any such claim, as they are now doing, for an examination of the feasibility of the project or other engineering details. A reference to the correspondence on this subject (My. 11) will make the matter clear. The Madras Government did not trouble themselves on that occasion to enquire whether the project would succeed or not. It should be noted that, if there was any scope for such an examination of the project under the Agreement, Madras would not have missed the first opportunity to exercise that riglit in connection with such a large project coming immediately after the Agreement of 1892.

8. It may be true that the interests of Madras involved in the present case are greater. But the principle remains the same . Once a decision is reached regarding the extent of prescriptive right and the mode of exercising it, there can be no legitimate reason for Madras to assume, as they have done, that Mysore will fail to give full effect to the final decision or will not be able to prevent the infringement of the Madras rights by the subordinate staff.

(*iii*) *Precautions for protecting Madras rights.*

9. All that is necessary to ensure the passing on to Madras of the quantity of water due to them, is careful measurement of the inflow into the reservoir at three selected places above it and the outflow from it at the place just below it. As long as the measurements upon these four places are carefully taken and watched from day to day, all the information necessary to protect the prescriptive rights of Madras unimpaired will be readily available. Also, automatic gauge recorders kept under responsible control can be easily fixed at the four places noted above and this will be an effective check on the sluice discharges. Thus the question of tampering with the sluices "at night" in any manner contrary to prescribed rules, will not arise at all. The engineering aspects, etc., referred to in the Arbitration proceedings of 7th August 1915, can only have reference to these measures. This perhaps justifies the view referred to in paragraph 5 above.

10. In connection with the more or less uncontrolled natural river system serving the Cauvery delta, it may not be possible to realise the extent of refinement that can be secured in respect of the adjustment of demand and supply possible under a large reservoir. A study of the system of the management of large reservoirs in Bombay, will show that, not infrequently, the supply falls short of the demand and that, on such occasions, the area of irrigation is reduced and the distribution of water correspondingly adjusted and kept under perfect control. Mysore propose to adopt an equally efficient system in the case of their reservoir. There can be no reasonable ground for apprehending any interference with the supplies to be passed on to Madras.

(*iv*) *Assumptions of Madras regarding regulating staff.*

11. But the greater part of the argument in Ma. 28 and Ma. 29 is based on certain assumptions about "temptations to tamper with the regulation" and "occasional altering for a few hours at nights the regulation of sluices" by subordinates and such other remarks.

It is incredible that Mysore, after having spent such a large amount on an important reservoir commanding such an extensive area, would leave its management to the tender mercies of irresponsible subordinates, particularly when Mysore have to respect their obligations to Madras.

12. Madras do not confine their remarks against the Mysore subordinate staff alone, but also state that the controlling officers too may not be "very vigilant" in managing their subordinate staff.

Madras also state that "even if the examination of working conditions showed that the Mysore project could be worked successfully within the limits of draw-off proposed, Madras would be still subjected to some risks on account of the very natural sympathies of the local staff with the local ryots, etc."

Madras have even suggested that the Mysore Durbar were not properly advised as regards the prospects of the project.

These statements are altogether unwarranted and it is regretted that they should find a place in an official document.

13. Madras no doubt guard themselves by stating that they would maintain a like opposition if a similar project had been put forward by the Bombay or the Bengal Government. But the Government of India would never have allowed Madras to go to such extremes if such a dispute had arisen with Bombay or Bengal. The supreme Government would have taken the whole question into their own hands and effectively prevented all unnecessary interference on the part of Madras.

(v) Sir John Benton's views.

14. Madras lay great store by certain remarks of Sir John Benton about the capacity of the Mysore reservoir. That officer examined the details of the reservoir on the basis of the Mysore requirements on the one hand and of the Madras prescriptive rights on the other. Under both these heads he had not sufficient data at his disposal at that time to arrive at a proper conclusion.

15. As regards the Mysore requirements, the total area dependent on the reservoir proper was taken as 150,000 acres and, on this basis, it was recommended by Sir John Benton that the capacity of the reservoir should be increased by 13,000 million cubic feet for irrigation purposes. But if due deduction is made for 25,000 acres proposed under tail-tanks fed by leakage and surplus water when available, the shortage in the reservoir, even according to his standard, would have been much smaller than the figure actually given by him.

Also, as regards the Madras prescriptive rights, Sir John Benton naturally took the word of Madras as his basis and formed rather exaggerated estimates about the requirements of Madras irrigation. But the actual prescriptive requirements of Madras, as now arrived at, are much less than what were roughly estimated by Sir John Benton on insufficient data.

Further, the mode of measurement under consideration when Sir John Benton examined the project, was the one proposed by Madras which imposed a very heavy burden on Mysore.

If all the data now available had been at his disposal, Sir John Benton would doubtless have arrived at very different conclusions.

16. In this connection, Madras have also referred to the suggestion of the Government of India to increase the size of the reservoir; but this was on the basis of figures arrived at by Sir John Benton, which, as stated above, require considerable modification. So long as the prescriptive rights of Madras are properly safeguarded and the regulation of the supply is in undeviating accordance with the accepted rules, the size of the reservoir or other details of the project can be of no consequence to Madras.

It may be stated here that the section of the dam as now calculated admits of its being raised by about 6 feet. Even if the dam is raised by 4 feet, an additional storage of about 5,000 million cubic feet will be secured. It should be open to Mysore to increase the size of the reservoir to this extent if they find it necessary to do so at any future time.

17. In conclusion, Mysore desire to state that they are resolved to perfect their gauging and regulating operations so that the supply due to Madras may be correctly passed on from day to day and the obligations of Mysore scrupulously fulfilled.

KARPUR SHRINIVASRAV,
Mysore Representative.

26th April 1914.

Exhibit Ma. 32.

Madras Reply to Mysore Note of 26th April 1914.

The Government of Madras consider it unnecessary to reply at length to the Mysore note of the 26th April 1914. With reference to the Mysore argument that because the Madras written statement read on the 7th August last was not formally filed and included in the proceedings, therefore the questions therein raised are not relevant to the fourth issue, the Madras Government would only invite attention once more to the express statement by the Arbitrator in the Proceedings of the 7th August that " it is understood that the fourth term of reference set out above will include a full examination of the project from its engineering aspects, including controlling agency and other matters relevant to the working of the project." Madras did not file their written statement because the Arbitrator accepted their contention and expressly recorded that the fourth term of reference would include these points which Madras now wish to be examined and the Mysore attempt now to exclude those points is obviously untenable.

2. The only other point on which Madras wish to reply is as regards the Marikanave reservoir. The conditions of that work differ fundamentally from the present case, as, in the Marikanave reservoir, there are no deep sluices in the dam capable of passing large quantities of water down to Madras and no arrangements have been come to for passing on any water to that Presidency. The Madras Government agreed to the construction of the Marikanave reservoir because they recognised that the water intercepted by it could not injure Madras irrigation, no matter how the reservoir was worked.

In the case of the Marikanave reservoir there was never any question of passing on a flow to Madras and the reservoir is one which, on the forecast, was expected only to fill rarely and which has so far never surplused or passed to Madras any water at all.

3. Under these circumstances, it is submitted that Mysore paragraphs 7 and 8 are due to misconception and that the case of the Marikanave reservoir is not in any way parallel or analogous to that of the Kannambadi reservoir.

4. The Government of Madras, while not admitting the other contentions advanced by Mysore, do not consider it necessary to reply to them, but maintain their previous views and leave the matter to the consideration of the Arbitrator.

W. M. Ellis, Col., R.E.,
Madras Representative.

29th April 1914.

Exhibit Ma. 33.

Representations by the Madras Representative regarding the award on issue 3 (a).

1. It is represented that under the rulings given as to the application of the award on the third issue to actual practice some alteration is called for in the terms of the last thirteen lines of the award commencing "Impounding in the south-west monsoon . . . . . "

2. The following appears to be the award as stated in the above thirteen lines :—

AWARD.

In the south-west monsoon.

(*a*) Impounding should be allowed to commence under standard table I if at *any time* during the preceding four days the Cauvery Dam gauge had exceeded 6 feet.

(*b*) If at any time during the preceding four days the Cauvery Dam gauge had not exceeded 6 feet impounding should be restricted to standard table II until the Kannambadi inflow reaches the equivalent value in cubic feet per second corresponding to 1,330 million cubic feet in twenty-four hours when this standard should be continued a further twelve hours.

(*c*) Hereafter impounding should continue under standard table I.

It appears to me that (*c*) above requires revision somewhat as under:—

(*c*) Hereafter impounding should continue under standard table I until the flow at Cauvery Dam has not exceeded 6 feet in any of the four preceding days when a change should be made to standard table II. This is subject to the proviso that when under the operation of the above rules standard table I is introduced it shall remain in operation for a minimum period of twelve hours.

W. M. ELLIS, COL., R.E.,
Madras Representative.

29th April 1914.

Enclosure.

Demi-official—from the Hon'ble Col. W. M. ELLIS, R.E., Madras Representative.

To—M. NETHERSOLE, Esq., Assessor, Mysore-Madras Cauvery Arbitration.

Dated—the 23rd April 1914.

I enclose a sample of the application of tables I and II in June 1896 as I read your answers to my queries on the award and I would be glad if you would let me know whether my interpretation is correct as there are several similar cases.

A. Ma. 33

I may note that there is no proviso that table I shall remain in force for twelve hours as in the case of table II which, however, is probably intended and is so shown in our example.

JUNE 1896.

Flow at Kannambadi M. c. ft.	Gauge at Cauvery Dam on same day. Feet.	Regulation
162	1·9	
150	2·1	
626	4·0	
821	3·8	
1,971	3·3	Table II twelve hours.
		,, I do.
5,957	3·8	,, II do.
		,, I do.
9,192	4·1	,, II do.
		,, I do.
6,053	7·4	,, II do.
		,, I do.
10,532	9·7	,, I do.

NOTE.—Commencement of impounding under table II and change from table I to table II is made under I (*a*), change to table I is made under II (ii).

Reply.

Yes; this is correct.

M. NETHERSOLE,
Assessor.

23rd April 1914.

No. 227-Arb., dated 23rd April 1914.

Copy forwarded to the Mysore Representative, Mysore-Madras Cauvery Arbitration Committee, for information.

W. M. ELLIS, COL., R.E.,
Madras Representative.

Exhibit Ma. 34.

Representation by the Madras Representative.

Throughout these proceedings the south-west monsoon has been taken to be the months of June to September inclusive and the north-east monsoon, October to January. When therefore the award gives rules for impounding during the south-west monsoon in the Mysore reservoir, the period embraced by the award is from 1st June to 30th September inclusive.

W. M. ELLIS, COL., R.E.,
Madras Representative.

1st May 1914.

Exhibit My. 29.

The award on the second issue specifies that a limit of 6·5 feet on the Cauvery Dam will fully safeguard the Madras prescriptive rights in the irrigation season. The season is defined as the period from 1st June to 31st January, the rest of the year from 1st February to 31st May, being considered the hot weather. All these dates have reference to the Cauvery Dam only, according to the award.

2. Throughout the discussions and for the purpose of trial working tables, it was agreed that the Cauvery Dam dates should be taken as the basis and that the period 1st June to 30th September is to be considered the south-west monsoon and the period 1st October to 31st January, the north-east monsoon. The corresponding dates at the Kannambadi Dam should, therefore, be four days prior to each of the above dates for each season.

3. The award on the third issue specifies separate proportions for the south-west and the north-east monsoons. The period of the south-west monsoon as referring to Kannambadi Dam can only be taken as extending from 28th May to 26th September inclusive; and the north-east monsoon, from the 27th September to 27th January inclusive.

KARPUR SHRINIVASRAV,
Mysore Representative.

1st May 1914.

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Exhibit My. 30.

Letter No. C. 123, dated Ootacamund, the 2nd May 1914, from Karpur Shrinivasrav Esq., Mysore Representative, to Sir H. D. Griffin, Kt., Arbitrator, Mysore-Madras Arbitration.

In the meeting held yesterday by the Assessor to discuss professional matters, the question of the application of tables I and II was again brought up and a fresh ruling was given by the Assessor in supersession of the two rulings already given for the purpose of explaining the intention of the award.

2. This fresh ruling has necessitated a modification in the working tables already prepared according to the previous rulings; and the results show that the quantities available for storage have been considerably reduced, thus placing Mysore at some disadvantage.

3. This has naturally led to a re-examination of the duty tables prepared by Mysore to suit the smaller quantity of storage now available in some years than that indicated by the lowest scale H shown in My. 27; and it has become necessary to apply a still lower scale for such years.

I therefore request that the scale K now sent may be treated as a supplement to the scales A to H already shown in My. 27 and be duly applied for the low stage of storage indicated by it, *i.e.*, for storage below 20,000 millions cubic feet at the end of September.

4. I am adopting this additional scale K where necessary in revising the Mysore working tables and I request that due intimation may be kindly sent to Madras also to follow a similar course.

5. I am sending a copy of this to the Assessor and to the Madras Representative to-day.

Enclosure.

Supplemental Scale of duties.

Case K—Storage less than 20,000 million cubic feet at the end of September.

Period	Monsoon crop M. C.Ft.	Perennial crop M. C.Ft.
October	51·5	27
November	34	18
December, 1st half	23	18
„ 2nd „	*Nil.*	18
January, 1st „	*Nil.*	18
„ 2nd „	...	*Nil.*
February	...	*Nil.**
March	...	10·8
April	...	10·8
May	...	10·8
June, 1st half	...	10·8

*Transplantation of new perennial crop will be started from 1st March instead of 1st February.

KARPUR SHRINIVASRAV,
Mysore Representative.

2nd May 1914.

Exhibit My. 31.

Letter No. C. 126, dated Ootacamund, the 4th May 1914, from Karpur Shrinivasrav, Esq., Mysore Representative, to Sir H. D. Griffin, Kt., Arbitrator, Mysore-Madras Arbitration.

I have the honour, by desire of the Mysore Government, to forward herewith in advance a copy of the note on the question of the hot weather flow of the Cauvery river which will be presented at the next meeting of the Arbitration Committee and to request that the specific points therein brought to notice may be kindly considered and an award based on the prescriptive right of Madras granted as an alternative to the one already given. The full reasons why Mysore ask for such an alternative have already been given in My. 19 and My. 20 and are again briefly reiterated in the accompanying note.

2. In short, Mysore are constrained to press for an alternative award, because,

(i) it would be impossible to act up to the award when the first stage of the reservoir comes into operation next year in accordance with the contract of the Mysore Government with the Mining Companies; and this stage, as already stated in paragraph 6 (*a*), My. 20, fully provides for all the requirements of the Mining Companies. (The contract deed will be produced for inspection, if required); and,

(ii) even in the second stage, the award would be unworkable unless the storage in the Kannambadi reservoir is, to some extent, to be set apart for the benefit of Madras without any reference to the actual demand for power.

3. I am sending a copy of this letter with accompaniments to the Assessor and to the Madras Representative.

Enclosures.

(1)

Note on hot weather flow.

As the time for closing the proceedings of the Arbitration is approaching, Mysore have once more to bring the matter in connection with hot weather supply to the notice of the Arbitration Committee.

2. The accompanying summary of the whole case explains the attitude taken up by Mysore and Madras from the beginning of the Arbitration proceedings in regard to this question. This clearly shows—

(*a*) that Mysore did not at any stage of the enquiry agree to bind themselves to pass down a continuous flow of 900 cusecs, but requested that Madras prescriptive rights should be defined with reference to their hot weather irrigation as it is the only basis upon which Madras can have any claim against Mysore according to the Agreement of 1892, and,

(*b*) that Madras too had always in view a limit flow based on the prescriptive right to their hot weather irrigation and that they only expressed their willingness to exchange it for a continuous flow of 900 cusecs so long as it could be maintained for power purposes.

3. As the award already given is not in accordance with the position taken up by both the Governments, Mysore immediately put in two statements My. 19 and My. 20 explaining the whole case and requesting the Arbitration Committee to give an alternative award based on the prescriptive rights of Madras to safeguard their hot weather irrigation. The ruling given by the Arbitrator on these statements was to the effect that " having considered My. 19 and My. 20, I am of opinion that no cause has been shown for re-opening the case as to the hot weather supply."

A. My. 31

4. Although there may be a difference of opinion as to whether sufficient cause has been shown or not for re-opening the question of 900 cusecs, based on the power requirements, there can be no doubt that the question of the prescriptive right of Madras for their hot weather irrigation has not been examined, though expressly asked for by both the Governments at all stages of the proceedings as can be seen from the accompanying summary.

5. It is therefore requested that the question of an alternative award on the basis of the prescriptive right may now be duly considered with reference to the area of hot weather irrigation in Madras.

The matter is very important for Mysore as, without such an alternative award, the present award would mean that Mysore should pass down 900 cusecs whether this quantity is required for generating power or not. It has been shown in My. 20 that there is no prospect of such a large demand arising for power generation. This would therefore impose an unnecessary burden on the reservoir, particularly as the natural flow goes down to 90 cusecs at times (discharge in the current year has gone down to less than *150* cusecs at Sivasamudram).

6. If Mysore have to be bound to the present award, an assured supply of 900 cusecs at Sivasamudram will be freely made available for use in Madras. With such an assured supply, even at the moderate duty of 60 acres per cusec, as much as $900 \times 60 = 54{,}000$ acres of sugar cane irrigation can be secured. It is obvious that the outturn due to such an assured supply would be much better than that due to the present precarious natural flow. The value of such crop may be taken as Rs. 300 per acre. This would secure to the Madras Government a revenue of 8 lakhs ($15 \times$ Rs. 54,000 = Rs. 8,10,000) even at the moderate rate of Rs. 15 per acre. Making an allowance of about 50 per cent of this revenue as derivable from natural flow, there will be a clear gain of 4 lakhs of rupees to Madras annually without any expenditure on their part. This would only mean that Mysore should build and work their reservoir to the benefit of Madras.

7. Viewed in this light, the award as now given without an alternative would subject Mysore to an unjustifiable burden. The Assessor too has recognised that Mysore is justified in objecting to such a perpetual burden being imposed on them whether the water is required for power or not (Paragraphs 115 and 116—A.E.E. II).

In A.E.E. II, paragraph 117, he has also recognised that it is desirable and necessary to make the question of prescriptive right of Madras for their hot weather irrigation " a specific item of the present Arbitration. "

8. The Arbitrator (*vide* page 14 of the award on the second term of reference), while quoting the summary of the Mysore contentions in this respect under three pertinent heads, has unfortunately not considered the question under any of these heads.

It is therefore earnestly urged that the question about the prescriptive right of Madras to the hot weather flow may not be left undecided but may now be duly considered and an award based on such prescriptive right given as an alternative to the one already given to safeguard the vital interests of Mysore.

(2)

Summary of the case of Mysore and Madras regarding the hot weather flow.

	HOT WEATHER FLOW.
Ma. 1.	In Ma. 1 no claim was put forward by Madras in respect of the hot weather flow.
My. 1, paragraph 32.	2. But Mysore, on the other hand, pointed out the advantage of the continuous hot weather flow in securing sugar cane crops to the extent of 60,000 acres with a revenue of four to six lakhs in the Madras territory and claimed some credit as a return for this.

Ma. 3, paragraphs 3 and 4.

3. In Ma. 3 Madras for the first time put forward a claim for 900 cusecs continuous flow at Sivasamudram.

My. 4, paragraphs 3 and 4.

4. Mysore objected to the passing down of 900 cusecs continuously demanded by Madras without any reason and stated that the hot weather flow in the river goes down as low as 94 cusecs.

Ma. 4, paragraphs 3 and 4.

5. To this Madras replied that, if the claim of 900 cusecs was denied by Mysore, Madras would claim, as an alternative throughout this period, the whole natural flow of the river up to the limits stated in Ma. 3, part II (*i*), this limit being expressed as 7 feet flow in the Agunda Cauvery prior to re-modelling.

My. 7, paragraph 78.

6. As Madras had previously waived their claim to the hot weather flow and as they withdrew that waiver subsequently, claiming as an alternative the whole natural flow up to the limit of 7 feet on the Cauvery Dam at the Upper Anicut as noted above, Mysore, while denying the claim of Madras for a constant flow of 900 cusecs as being not based on prescriptive right, implied their willingness to respect the Madras right to the natural flow in the very sense claimed by Madras, the point remaining to be settled being whether 7 feet at the Cauvery Dam as claimed or some other limit L to be fixed under the second term of reference as stated by Madras in paragraph 77, part IV, would represent the prescriptive right of Madras for their hot weather irrigation.

Ma. 10, paragraph 77, Part IV.

7. Thus, regarding the question that the hot weather flow due to Madras should be fixed on the basis of prescriptive right for their irrigation requirements, there was so far no difference between the position taken up by Madras and Mysore.

Ma. 12, Part VI, paragraph 99.

8. Madras again confirmed their attitude that the claim for 900 cusecs was not based on prescriptive right, but that their right to the water required for their irrigation, as used in the past years by means of *korambus*, should be respected, *i.e.*, to the whole natural flow up to the limit of 7 feet noted above.

My. 9, paragraph 88.

9. As a limit flow of 7 feet claimed by Madras could not be realised in the hot weather season and as even if it could be had for a few days in exceptional years it would not be fully used for irrigation, Mysore suggested that the prescriptive rights of Madras might be limited to the average estimated natural flow in the hot weather and not to 7 feet as claimed by Madras

Ma. 14, Part IX, paragraph 99.

10. Madras objected to the prescriptive right being limited to the average estimated natural flow, and adhered to their original claim for the whole natural flow up to their own limit of 7 feet, on the strength of the supposed admission of such a right by Mysore in My. 7, paragraph 78.

My. 12, paragraphs 11 to 16 and paragraphs 72 to 75.

11. As there was evidently some misunderstanding on the part of Madras as regards the intention of paragraph 78, My. 7, the question of the hot weather flow was fully explained by Mysore both in its legal and engineering aspects in paragraphs 11 to 16 and 72 to 75 of My. 12.

12. In this Mysore. have clearly shown:—

(*a*) That the power supply is not a constant factor for various reasons and can give no sort of prescriptive right to Madras.

(*b*) That the only basis for settling the prescriptive right of Madras according to the Agreement of 1892, is with reference to the quantity of water required by them for their hot weather irrigation; and

(*c*) That such rights should be defined by reasonable limits of flow required for the areas of actual hot weather irrigation, as practised in the previous years based on the figures supplied by Madras.

Ma. 22, Part XI, paragraph 6.
Ma. 22, Part XII, paragraphs 42—47.

13. In reply to this Madras also made the whole question from their point of view clear by stating—

(i) That they did not suggest that the question of prescription would not arise with reference to the hot weather flow—paragraph 6, Part XI;

(ii) That the expression "whole natural flow" used by Madras was *always* subject to the understood limit of 7 feet at the Cauvery Dam claimed by them;

(iii) That, in consideration of the actual area of hot weather irrigation and having regard to the safety of the *korambus*, they withdrew their original claim to the unnecessarily high limit of 7 feet and restricted it to a limit of 9,000 cusecs; and

(iv) That they were willing to waive their right to this limit flow of 9,000 cusecs in consideration of 900 cusecs continuous flow if passed down; failing which that their right to the limit of 9,000 cusecs must be recognised unimpaired.

14. From all the above, two important points are prominently brought to view :—

(1) That Mysore never at any stage agreed *to bind themselves to Madras* for passing a continuous flow of 900 cusecs ; and

(2) That Madras had always in view a limit flow based on their prescriptive right to their hot weather irrigation and that they were willing to exchange it for a continuous flow of 900 cusecs so long as it could be maintained.

Exhibit Ma. 35.

Statement of case by the Government of Madras regarding Issues 3 (b) and 4, Mysore-Madras Cauvery Arbitration.

PRELIMINARY REMARKS.

The issues still to be adjudicated on are issues 3 *(b)* and 4.

These have reference to :—

Issue 3 *(b)*.—The rules of regulation and the currency of the tentative period as regards factors and also whether the rules should be tentative for a certain period and if so, for how long.

Issue 4.—This issue comprises the consideration of and examination of the working conditions of the reservoir, the methods of operation, measurements and control of water and of giving effect to the rules of regulation. This includes examiniation of engineering details such as nature of sluices, measuring and controlling arrangements, controlling staff and generally the practical and material means by which the rules are in practice to be given effect to.

2. It is clear that the consideration under Issues 3 *(b)* and 4 are interdependent, as, without a clear conception of the conditions of practical working, it is not possible to consider rules of regulation. In this statement the several subjects, *viz.*—

(1) Rules of Regulation;

(2) Duration of tentative period;

(3) Operation and engineering details of the reservoir and the controlling agency, are dealt with, as far as possible, *seriatim*; but, as they unavoidably overlap, the matters in question should be considered as a whole, and it should be recognised that the control and engineering and regulation details of the the reservoir are relevant to, and have a bearing on, the rules of regulation, methods of measurement, etc., and *vice versa*.

(1) RULES OF REGULATION.

3. Subject to this reservation, the Government of Madras suggest as suitable the following rules of regulation :—

Draft Rules of Regulation.

I. The operation and carrying out of the Rules of Regulation shall be the duty of a controlling officer and of a subordinate staff working under his control.

II. The water to be passed down the river from the dam must be passed through the scouring sluices of the dam or over the surplus weir or partly through one and partly over the other at the discretion of the controlling officer who will, however, exercise such discretion in general accordance with the instructions of the Mysore Government.

III. *(a)* The quantity of water to be passed to Madras will be computed every twelve hours from the records of inflow into the reservoir of the previous twelve hours and the record of gauge-readings at the Cauvery Dam of the previous four days and computed under the operation of the terms of the award as finally confirmed.

The inflow into the reservoir to be the totals of the actual measured flow of the Cauvery, Hemavati and Lakshmanathirtha rivers *plus* the unmeasured inflow into the reservoir from the catchment between the three places of measurement and the Kannambadi Dam. The allowance for this inflow to be computed as may be determined by the Government of India subject to the proviso in paragraph 4 below.

To the computed inflow into the reservoir the quantity of water required to supply any extensions of irrigation in excess of 8,000 acres above the area now irrigated by channels taking off above the places of measurement, shall be added to arrive at the natural flow for purpose of computing the amount of water due to Madras.

(b) To arrive at the quantity of water to be passed through or over the reservoir dam, to the quantity of water to be passed to Madras computed under (*a*) above, must be added any quantity of water required for the supply of any extension or change in character of irrigation under the Cauvery channels taking off below the reservoir in excess of the quantity required for the area and nature of irrigation now cultivated.

(c) The duty allowance to be made in cases (*a*) and (*b*) above should be those now actually realised in cultivation of similar irrigation under existing Mysore channels less 10 per cent allowance for improvements due to the more modern character of the extended or new distribution arrangements.

These duties to be ascertained by actual measurement.

IV. The quantities of water passing through sluices and the regulation orders for the sluice shutters shall be computed by the application of ordinary sluice discharge formula $D = CA\sqrt{2gh}$.

The quantities of water actually being passed down will be verified from a gauging station, with a self-recording level and discharge recording instrument which will be installed between the dam and the Chick Devaroy Sagar Anicut. The discharges over this anicut which are deduced from gauge-readings may also be used as a check of this quantity.

V. The minor variations, deficits or excesses in quantity due to Madras which may be displayed by the record of each period between regulation to be allowed for in the next period of regulation.

VI. All regulation calculations and computations to be recorded in a register called the "Regulation Register" and the orders for regulation which results from the computations to be also recorded under the signature of the controlling officer and a copy of such calculations and orders, with record of daily inflow and gauge-readings, to be mailed daily by the controlling officer to each Government.

The amount of inflow and issue daily from the reservoir to be wired daily to each Government.

VII. Under ordinary conditions regulation of sluices will take place twice daily, between 6 A.M. and 7 A.M. and between 6 P.M. and 7 P.M. and the controlling officer shall personally satisfy himself when the sluices are finally adjusted that the regulation has been accurately carried out in accordance with recorded orders and certify that he has done so in the "Regulation Register." Under extraordinary circumstances only shall sluices be manipulated other than at twelve hours intervals and in such case full information regarding the reasons and necessity for this and the nature of the intermediate regulation should be communicated by the controlling officer to each Government.

VIII. The controlling officer shall give every facility for inspection of his books, calculations, records of regulation, and actual methods of regulation, and gauge reading, and discharge recording, etc., to any officer of either Government appointed and authorised by that Government to make inquiry and inspection on their behalf. The controlling officer and duly accredited inspecting officers shall have full use of telephones, telegraphs or other means of communication installed in connection with the works.

IX. The "draw-off" for all new irrigation whether under canals taking off direct from the reservoir or under existing or new channels taking off below the reservoir shall, except when the reservoir is surplusing, be restricted within reasonable limits to the quantities advanced by Mysore as their proposed draw-offs for the purpose of examining the working conditions of their project (My. 25 and 27) and the daily draw-off shall be measured and recorded by the controlling officer. The controling officer shall give effect to any instructions as regards draw-off day by day which may be conveyed to him by the authorised Mysore officers, but the

Government of Mysore shall be responsible that the total seasonal "draw-off" for the monsoon period (16th June to 15th January) and the dry weather period (16th January to 15th June) is restricted within the total limits referred to.

X. That these rules shall be subject to alteration and amendment from time to time as may be found desirable under the conditions and limitations described in paragaph 8 below.

4. The proviso suggested as regards the allowance for inflow of the catchment below the three places of measurement is that if either party are not satisfied with the allowances made it shall be open to them to establish at their own cost on any of the streams falling into the reservoir below the three gauging sites further gauging stations for the purpose of actually measuring the daily inflow and to claim that such measurement shall be substituted for the computed allowance of the catchment so measured.

5. Referring to the last clause of the proposed rule III (*a*) relating to new irrigation taking off above the places of measurement of inflow into the reservoir, a few words are called for. Under existing conditions, the area of irrigation under the Mysore Cauvery channels has reached the limit of reasonably secured cultivation under the incidence of natural flow apart from storage and cannot be extended because such extensions would prejudice and cut off the supply to the channels below. Under the conditions introduced by the construction of the Kannambad reservoir the existing irrigation below the reservoir can be secured by issue of water impounded in the reservoir and the supply to that irrigation being thus secured by the reservoir, it would be practicable for Mysore to extend irrigation under the upper channels up to the limit of the existing irrigation below the reservoir. It will be thus seen that any extension of the upper irrigation is really secured by and supplied through the instrumentality of the reservoir.

As the flow to supply such upper irrigation must be obtained by drawing off from the "natural flow" of the river, allowance for this must equitably be made in the computation of "inflow" into the reservoir which should be based on natural flow as it would be without such draw-off and not on what that flow is reduced to through the draw-off required to supply the new extensions of upper irrigation, such extensions being only rendered possible, as above shown, by the construction of the reservoir.

The construction of the reservoir involves submerging and throwing out of cultivation an area of 8,000 acres now irrigated under the Cauvery and to this extent the extension of cultivation above the the points of measurement will only restore the existing state of affairs and thus no allowance for extending up to this area is due.

Mysore have admitted that they now propose to extend irrigation from channels taking off above the Kannambadi reservoir to an extent of 20,000 acres and it will be obvious that the interests of Madras require consideration and protection in this matter and that unrestricted extension cannot but imperil rights of Madras.

6. As regards Rule IX above, if the final finding and award is to the effect that success or failure of Mysore project is in no way material to the protection of Madras rights, the *raison d'etre* of this rule will disappear.

Some such rule restricting draw-off of Mysore is, however, essential under a finding which recognises that in considering the protection of Madras rights the extent of success or failure of Mysore project is a material consideration. The Madras and Mysore arguments on this matter have already been put in Ma. 28, 29 and 32 and My. 28, but the finding of the Arbitrator on the matter has not been given.

(2) Duration of Tentative Period.

7. As regards the question :—

"Whether the rules as first formulated should be tentative and, if so, for what period and to what extent?"

It is represented that the award on Issue 3 (*a*) has enunciated the *principles* of regulation and also has fixed tentatively the "proportion factors" and "percentage factors for transmission losses" the former being :—

South-west monsoon, June to September	...	...	·625
North-east monsoon, October to January	...	...	·30

and the percentage taken on the flow at Kannambadi which is :—

			Per cent.
South-west monsoon	...	...	20
North-east	...	...	17

The above proportions and percentages are under the terms of the award to be tentative and thus the conditions of working of Rule III would to this extent be tentative.

8. As regards actual rules of regulation, there is no reason why these, apart from the above, should be tentative in so far as general directions are concerned; on the other hand, it is recognised that absolute finality or infallibility cannot be looked for in human affairs, and that, moreover, application of rules made years before a work is complete and intended to control the operation of such work after completion, is sure in some matters of detail to be found inconvenient or even unworkable.

It is therefore represented that whenever the application of rules is admitted by both parties to involve such inconvenience as to render change desirable that :—

(*a*) the rules may be altered first tentatively for one year or two years by agreement of both parties or in default of agreement under the decision of the Government of India after hearing both parties.

(*b*) at the end of such period the amended rules may be confirmed similarly either by consent of both parties or if only one party wishes confirmation under the orders of the Government of India after hearing both parties.

(*c*) This proviso regarding rules, apart from proportion and percentages, to have unrestricted application as regards time.

9. As regards proportion and percentage factors it is desirable to fix factors and proportions as early as possible.

In considering how long the factors must be tentative before final decision on this point is made, it is desirable to pass in review the available realiable and relevant information.

10. *First as regards the discharge at Kannambadi.*—We have the daily yield of the most important part of this catchment in the form of daily gauge-readings at Chamaraj Anicut on the Cauvery since 1896 and at Sriramadevar Anicut on the Hemavati since 1893. It is desirable to verify the discharges of these anicuts arrived at by calculation, by means of velocity observations and gaugings and the verification of results and any necessary corrections can be carried out within the next three or four years.

There would then be available daily discharges of both the Cauvery and Hemavati rivers for upwards of twenty years.

The yield of the Lakshmantirtha and the yield of the plains (maidan) catchment below the anicuts and above Kannambadi has, however, never been observed nor any gauge readings bearing on this taken up to 1913. It is considered that four years more observations are required to enable sufficiently realiable proportions to be applied for each half month to the known yield of the Cauvery and the Hemavati to get a realiable estimate of the yield of the Lakshmantirtha.

For the yield of the plains catchment, further observations of rainfall and run-off due to this is likely to enable a fair approximate estimate of the yield of this in terms of factors applied to daily rainfalls to be made; this, however, is likely to be the most doubtful item. Up to the end of July it is not likely to be a very material factor in the totals but in September and October the yield may prove to be material at any rate in a year of good rainfall.

11. It is submitted that the matter of fixing permanently the tentative factors may be considered after four years' observation.

During these four years daily observations of the yield of the Cauvery at Kannambadi must be made. This may be done anywhere near Kannambadi for the present year, and possibly for the next year but after that it must be done above the water-spread of the smaller Kannambadi reservoir by measuring and adding together the inflow on the three rivers.

Daily flow must this year and all succeeding years be taken of the Cauvery below the new dam and above the Chick Davaroy Sagar Anicut and daily readings of the gauges of the Chick Devaroy Sagar and Devaroy Anicuts are also necessary. The above will give daily discharge below the dam although after next year natural flow will be subject to some interference by the operation of the smaller reservoir.

12. *The discharge of Sivasamudrum.*—From the year 1902 daily gauge-readings at the anicut built in connection with the power works are available.

From the calibration of the main gauge on this anicut by velocity observations which must be taken this year below Danakere Anicut it is anticipated that reasonably accurate daily discharges from 1902 to 1904 will be made available (thirteen years).

The Sivasamudram Anicut is to be raised next year and recalibration of gauge after this raising must ensue. At the end of four years however sixteen years' daily discharges at Sivasamudram will be available and this, giving as it will, a measure of the yield of the Kabbini and intermediate catchment between Kannambadi and Sivasamudram, be valuable in considering the matter of "factors" to be fixed.

13. Daily gauge-readings above and below the Hulhalli Anicut on the Kabbini should be taken during the same period as these are likely to be useful in estimating the yield of the intermediate catchment excluding the Kabbini, as also of the Kabbini itself. Whether velocity observations with a view to calibrating the gauge at this anicut will be necessary or not is a matter which need now be settled but it is represented that the gauge-readings should be taken as these involve little expense and may prove valuable.

14. *Discharge at the Bhavani Bridge over the Cauvery.*—The gauge here has already been calibrated and daily gauge-readings for thirty years are available. The daily gauge-readings will be continued.

15. *Upper Anicut.*—The same remark applies. A self-recording gauge will also be installed here as a check on the daily readings.

16. It will be seen that the doubtful item in the whole problem is the yield of the Lakshmanatirtha and plains (maidan) catchment between the Chamaraja and Sriramadevar Anicuts and Kannambadi.

17. If, at the end of four years, it is decided by the Government of India, after hearing both parties, that the yield of this catchment is sufficiently well based considering its relative importance, to enable permanent factors to be fixed, these will be fixed after four years at which time there will be available :—

(*a*) Daily discharges from 1896 to 1917 (22 years) of the Cauvery and Hemavati.

(*b*) Deduced and computed discharges of catchment of Lakshmanatirtha and of the plain catchment above Kannambadi.

(*c*) Daily discharges at Sivasamudram from 1902 to 1917 (16 years).

(*d*) Daily discharges at Upper Anicut and Bhavani bridge of the whole period.

18. Of the above items (*b*) is the only one based on assumption and the daily yield of the Lakshmanatirtha from actual observations will be known for five years in 1917.

In view of the minor importance of (*b*) it is considered that final factors could be fixed by the Government of India in 1917-18.

19. In any case review of the tentative factors should be made in that year and it must be left with the Government of India to decide whether these are to be then finally fixed or merely revised and left subject to further revision.

20. It is to be recognised that a final settlement is desirable as soon as possible in order to set at rest the contention between the two Governments and to enable both parties to know how they stand as regards their rights to the yield of the catchments above the Upper Anicut, all of which are involved in this question of "factors."

21. As regards the selection of suitable gauging stations, methods of gauging, sites for erection of gauges or gauge wells and of self-recording instruments, the matters are professional details which may, it is suggested, be left to the two Governments to settle together and on which, in most cases, there will, it is believed and hoped, be little difference of opinion as the object of both Governments is to get the most reliable data possible. In cases of differences of opinion both Governments should, it is proposed, refer the case for final orders to the Government of India, the statement of each being communicated to the other.

22. It is suggested that if any observations, gauge-readings, velocities, etc., are desired by one Government which the Government of India and the other Government consider unnecessary, that Government, if it still desires it, shall be allowed to take such observations, etc., and shall be given all reasonable facilities and assistance in taking them, provided that the whole expense in connection therewith is defrayed by that Government.

23. It is hoped and believed that none of these proposals will be found to be contentious and that the object of both parties as regards these investigations being the same, the matter will be treated in a friendly and non-contentious spirit and these proposals are formulated with this view.

24. The proposal of the Madras Government as regards the duration of the tentative period is that it shall be four years at the end of which time the question shall be reviewed by the Government of India after hearing both parties and, if found practicable, final factors will then be fixed.

(3) Operation and Engineering details of the Reservoir.

25. The view of the Government of Madras as regards the giving or withholding assent to the construction of the Mysore Cauvery Project works has been throughout these Arbitration Proceedings and throughout the correspondence leading up to them that if it could be shown that on well based forecast of the prospects of the project, worked out on a basis of passing down to Madras the water which was required to protect their rights, the success of the project was well assured, that assent should not be withheld; but that, if the prospect of success under such conditions as regards passing on water to Madras, was shown to be ill-secured and the working conditions indicated occasional severe failure or frequent minor failures, then assent should be withheld.

The arguments in support of this view have been given in Ma. 28, 29 and 32 and will not here be repeated.

26. If it is held that the measure of success or failure of the Mysore project is an immaterial consideration in dealing with protection and conservation of Madras rights, there can be no question that, apart from technical considerations as regards efficiency of the structures and modes of operating, the assent to the project should not be withheld.

27. If, on the other hand, the measure of success or failure is recognised as a material consideration, the working tables drawn up, on the basis agreed on, to give a forecast of the working of the project and the measure of success in passing the required quantities of water to the area to be irrigated, must be material pieces of evidence and requires the careful consideration of the Arbitrator.

28. Proceeding then to discuss the basis of these working tables (Ma. 35-1—13) the areas to be irrigated are those stated by Mysore as their project proposals (My. 25). The duties for the monsoon crop advanced by Mysore have been accepted by Madras as a basis for the working tables although in the opinion of Madras these duties are pitched somewhat high.

The duties for the perennial crop have after discussion been fixed by the Assessor in Proceedings, dated 22nd April 1914.

The rules fixing incidence of draw-off half-month by half-month to be applied to years of different character, which rules form the basis of the "draw-offs" of the tables are those fixed by Mysore (My. 27 and My. 30) to which attention is invited. The years are, under the above, divided into classes A to K in accordance with the character of the seasons and water available in the reservoir and the measure of success or failure may be gauged by the classification in which under the working tables each year falls.

29. In the statement attached to this note, details are given showing the duties worked to under each classification as compared with the accepted duties referred to in paragraph 28 above and also the proportion of total area of perennial crop irrigated under each classification.

Classification A represents the full measure of success as regards the supply of water, that is, supply of the whole area at the accepted duties. Successful operation is connoted by supply of water to:—

85,000 acres monsoon crop to be supplied with water June 16th to January 15th at the duties shown under classification.

40,000 acres perrenial crop to be supplied throughout the year at a constant duty of 64 acres per cusec.

30. The years coming under classifications A as a result of the examination made by working tables for the thirteen years 1896 to 1908 (Ma. 35-1—13) now presented are the fully successful years.

Years coming under any of the classification B to K represent failure to a greater or less degree.

The degree of failure can be gauged in detail by reference to the statement attached and by considering to what extent under each classification failure to attain to class A standard is denoted.

For purposes of less detailed classification the following is suggested as a fair general classification:—

(*a*) Minor failure classes *B* & *C*.	Years in which the whole area of perennial crop is cultivated with full supply but in which the supply of water to monsoon crop is materially deficient for two and a half months at the end of the seven months season.
(*b*) Medium failure classes *D* & *E*.	Years in which the area of perennial crop cultivated is reduced by amounts between 60 per cent and 16 per cent and in which also supply of water to monsoon crop is seriously deficient for two and a half months at the end of the season of seven months constituting the period of supply and in which the perennial crop normal supply is also materially reduced for three months.
(*c*) Major failure classes *F* to *K*.	Years in which area of perennial crop is reduced 66 per cent and upwards and in which the supply to monsoon crop is very seriously deficient for not less than two and a half months at the end of the seven months season and in which the supply to perennial crop is also seriously deficient for not less than three months or stopped altogether for one and a half months.

31. It is represented that the class *A* duties agreed on as reasonable for purposes of examining the prospects of working the reservoir are on the whole high duties. They are duties which may possibly be realised but not without most careful design of the distributary system and economical distribution of water. The failure to give such supplies connotes real deficiency such as must seriously affect outturn of crop.

32. The classification of the thirteen years examined by means of working tables give the following results year by year:—

Year	Class of year
1896-97	C
1897-98	A
1898-99	A
1899-00	K
1900-01	B
1901-02	A
1902-03	A
1903-04	A
1904-05	C
1905-06	H & E
1906-07	A
1907-08	B
1908-09	F

Note.—The dual classification H and E signified that "H" duties were applied for the month of October only and subsequently the *E* class duties. The year would be slightly worse than an *E* year but is taken as included in *E* class.

The rough re-classification according to the scale of paragraph 30 gives the following results for the whole thirteen years:—

	Years
Full success	6
Minor failure	4
Medium	1
Major	2
	13

The year 1899 class K represents *a most disastrous failure.*

Of the whole period of thirteen years, in only six years can an adequate supply of water be given even working on economical and high pitched duties be attained and failure to a greater or less extent is indicated in seven years out of thirteen.

33. It is perfectly clear that the working conditions of the Mysore project, as now for the first time displayed by the working tables, cannot be considered as reasonably secured, and it is also quite clear that the prospects of success of the project are not promising and the operation is likely to result in very frequent failure as regards the supply of water to the areas to be irrigated and not infrequent very serious failure. The measure of failure displayed in these working tables is far more serious than that shown in the original working tables made out by Madras in 1909 on the rough assumptions and data which then had to be used. In these original tables Madras showed failure in three years in twenty years. It is now shown that failure is likely to occur in seven years in thirteen years and that in two years the failure is very serious.

It is represented that as regards the earlier representations made, the Government of India took the view that well-assured prospect of success was necessary for the Mysore project and in the absence of such success Madras were justified in refusing assent to the project. The Government of India, moreover, considered the extent of failure shown in the Madras original tables (three years in twenty) justified the Madras refusal of assent and the recommendations of the Supreme Government were that Mysore should so alter their project proposals as to ensure their project against such failure as was indicated in the working tables before them (*vide* Ma. 29, paragraph 17).

34. It is therefore represented by the Madras Government that if success or failure is found to be a material consideration in giving a finding on the fourth issue and it is urged that it is the most material one that the working tables now presented show that undoubted failure is indicated. The project prospects are distinctly unfavourable and are such that if submitted as a productive project by the Government of Madras to the Supreme Government, would certainly not meet with approval or sanction.

35. It is here further contended that the correctness of the proposition of Madras (Ma. 29, paragraph 16) that the Mysore Durbar had not been advised correctly by their Engineers as regards the prospects of the project is fully borne out

by these working tables and is now fully established. It is not suggested that the Mysore Engineers knowingly misrepresented the prospects of this project but that they took optimistic views of its prospects and have not till now themselves known or realised that the prospects of successful operation of the project are remote and that reasonable forecast of working prospects indicates material failure.

36. It is further to be considered that the Mysore project contemplates further extensions of area 25,000 acres monsoon crop under existing tanks to be filled from the canal when the main reservoir is surplusing and when therefore it is safe to draw off from the Cauvery to the full extent of the carrying capacity of the canals. The total extra draw-off contemplated for this is stated by Mysore to be 4,000 million cubic feet yearly [*vide* My. 19 (*a*), paragraph 4 (*d*)] and would take 39 days to fill the tanks to this extent. The working tables show that in the years 1899 and 1905 the reservoir never surpluses, while in the years 1898, 1902, 1906, the surplusing is less than 19 days, while 39 days surplusing is only realised in three years out of the thirteen. Thus, this extra 25,000 acres also forming part of the project will be subject to constant minor, and not infrequent major, failures.

37. The Government of Madras represent that the conditions of working the Mysore project have been shown to be such as to indicate very frequent minor failure and not infrequent serious failure and that this fully justified their original refusal to assent to the project and that the finding on the fourth issue should uphold and confirm this refusal.

38. The further representations made are concerned with the conditions of working and controlling the working of the reservoir in the event of the assent to the project being eventually given.

39. The general outlines of the scheme and reservoir are given in the revised edition "Cauvery Reservoir Project in Mysore" generally referred to as the Kannambadi Reservoir Project. In this, however, but few of the engineering details are given but only the broad lines of the project.

As regards the dam, two typical profiles are given :

(1) showing the dam where there are no sluices.

(2) showing the dam where one of the lowest undersluices is placed.

Also a cross section of the site showing a longitudinal small scale section of the dam and forecast of stepping of foundations is shown. On this section, the position of proposed scouring sluices and irrigation sluices is shown, but the spacing of the sluice is not given.

A contour plan scale 1" = 400 feet of the dam and its immediate vicinity is furnished which enables some idea to be formed of the conditions of run-off of the surplus passing through the sluices or over the waste weir in floods.

40. Generally, Madras are concerned with the soundness and safety of the works and the operation of the provisions for passing water to Madras without risk of failure.

It may be said at once that so far as could be seen from the brief inspection made in August 1913 of the works in company with the Inspector-General of Irrigation, there was nothing to take exception to in the character of the work in progress, and the quality of work appeared quite satisfactory.

Details, plans and specification are, however, required regarding the sluices to be placed in the dam and their mode of working, their spacing and the limits within which the increased thickness of the dam at the sluices on each flank of each set of sluices is to extend. The pressure calculations for the piers of the sluices should be furnished with a memorandum showing on what data and assumptions these calculations were made.

41. As regards the sluices provided in the project which will pass supply to Madras, these are the scouring sluices and are :—

(*a*) Eight deep sluices in the centre of the dam each 6' × 12'. The project estimate only shows six, but by agreement made by the Chief Engineer for Irrigation, Madras, with the present Dewan, Mysore, agreed to increase this number to eight in connection with the building of the small reservoir to which assent was given by Madras but which does not form an item of the present enquiry.

These deep central sluices will presumably only be worked when the level of water in the reservoir is insufficient to give the supply to be passed to Madras through the flank sluices.

(*b*) Two sets of flank scouring sluices, *viz.*—

Right flank sluices, fifteen in number, each 6′×12′, with sills at level+2394.

Right flank sluice, one in number, 4′×8′ with sill level+2384.

Left flank sluice, three in number, each 6′×12′ with sill at+2394.

Left flank sluice, one in number, 4′×8′ with sill at+2384.

Thus, we have eighteen flanks sluices of 6′×12′ with sills at+2394 and two flank sluices of 4′×8′ with sills at+2384.

It is considered that for purposes of rapid and efficient regulation—

(*a*) All sluice gear should be connected with a recorder showing what height the shutter is lifted off the sill.

(*b*) That the flank sluices of 6′×12′, which will be the ones most constantly worked, should be geared together in sets of three or five sluices so that the shutters are raised simultaneously and together to the same height by means of a shaft actuating each sluice lifting gear.

Each sluice or set of sluices should have a locking and sealing arrangement so that the regulation cannot be altered except with the cognisance of the controlling officer who would keep the keys and seal in his personal custody.

42. *Measurements of inflow and issue of water during the operation of the Reservoir Project.*—The proposals put forward below on this subject have reference to the operation of the regulation of the project and not to the measurements to be made with a view to fixing proportion factors, but it is of course hoped that the arrangements made with regard to the latter will be suitable and applicable to use in respect to the former.

It is proposed that the sites be selected at which gauges are to be installed on the three rivers Cauvery, Hemavati and Lakshmanatirtha.

These sites should be the nearest ones above the proposed waterspread level of the reservoir which will best fill the following qualifications:—

(1) They should not be liable to changes for different stages of river flow, that is, the bed should be hard and not likely to scour. They should be sites which are suitable or in the vicinity of the sites which are suitable for fixing gauges and for the calibration of the gauges by velocity observations of flow.

(2) They should be sites in which the level of water in the reservoir will not affect the levels of flow. That is, sites must be such that the same discharge will be connoted by the same gauge levels, irrespective of level of water in the reservoir.

(3) The off-takes between the sites and the reservoir should be as few as circumstances permit of.

(4) The sites should be, if possible, convenient of access for inspecting officers and the recording staff and should be the most suitable ones having in view all the circumstances of the case.

43. At each of the selected sites standard gauges shall be erected and these gauges will be calibrated by a series of velocity and discharge observations taken by joint Madras and Mysore parties and such observations shall be continued till both parties are satisfied that the calibration is materially correct.

This calibration is to ascertain the discharge which each reading of the standard gauge connotes and to produce a curve showing the constant relation between gauge-reading and discharge.

At each site a permanent station for taking velocity and discharge observations should be established and such observations should be taken on a few days yearly as a check on the continued accuracy of the original calibration.

At each site the following self-recording water level recorders and instruments shall be installed in two separate wells near the river margin, each with a separate connection with the river, so that the water in each well will be the same level as the river water level.

Over one will be installed an ordinary automatic water level recorder designed to run sixteen days. The records from this will be changed half-monthly.

Over the other well will be installed another recorder in electric connection with Kannambadi and designed so that the recording diagram of water levels shall be reproduced in the control room at Kannambadi. In this room also an automatic integrating drum specially made to record total discharge of every six hours at each station will be installed and the quantities so recorded shall be the standard for regulation.

Each station will also be in telephonic connection with the *control room* at Kannambadi.

44. It is proposed that at a suitable site below the dam and above Chik Devaroya Sagar Anicut a gauging station similar to the above shall be established and the gauge here accurately calibrated.

The station should be sufficiently far below the dam to be free from the turmoil and turbulance caused by the water issuing from the sluices or from the surplus weir of the reservoir and sufficiently far above the anicut not to be materially influenced by the conditions of draw-off of the channels at that place. In connection with this station an automatic water level recorder shall be installed connected electrically with a discharge recording integrating machine in the control room at the dam.

45. The controlling officer would thus have recorded in his control room at the dam not only the total inflow every six hours but the total water passed down each six hours and thus would have the necessary information before him to enable him to adjust and regulate for the succeeding period with the greatest practicable accuracy.

46. Automatic water level recorders and also gauges to be read three times daily shall also be installed:—

(*a*) In the reservoir at some convenient site clear of the draw of the sluice;

(*b*) In connection with the upper gauge at Chik Devaroya Sagar Anicut.

For these sites, it is not considered necessary to have electrically actuated discharge records in the control room.

47. The originals of all the half-monthly diagrams of gauge-readings as well as records of individual gauge-readings will be recorded by the controlling officer and two photographic reproduction of the originals, diagrams and copies of the record of individual gauge-readings will be sent half-monthly to the representative of each Government.

Gauge readers will be appointed to read three or more times daily the gauges at each station and telephone the results to the controlling officer, sending also daily or weekly written statement of the same.

This officer will check these results against the recorded levels transmitted electrically by the automatic recorders and will also, on receipt of half-monthly diagrams, compare these with the readings telephoned.

48. The various records will form a check on one another and discrepancies due to either the default of the gauge-readers or of the recording instruments or arrangements will be made subject of immediate enquiry and thus accurate work will be, as far as practicable, ensured.

Controlling Agency.

49. In the event of the finding as regards the construction of the Kannambadi reservoir being in favour of such construction, Madras Government propose the following arrangements to ensure local control and regulation in accordance with the approved rules, namely—

(1) That the control of regulation and of gauging and record of discharges at selected sites where such have to be measured shall be vested in a special officer of the rank of Executive Engineer unconnected either with Madras or Mysore who shall be appointed by the Government of India, the selection being referred to and accepted by both Governments. This officer shall have charge of all the gaugings

and records of flow into the reservoir and of issues through or over the reservoir dams and he shall communicate daily by wire and letter to both parties the results of such observations and regulations.

(2) The special officer shall have under his orders and control a suitable establishment of subordinates to carry out orders as regards regulation, etc., and this staff shall also be independent of both Governments and shall be appointed by the Government of India or by the special officer himself. The special officer shall give all facilities for inspection of his work, records, etc., to any officer or officers appointed by either Government on this behalf and shall promptly furnish any information on this subject asked for by either Government or by such officers, but he shall be in no way subordinate to either but be responsible to the Government of India. He will, however, be responsible to the Government of Mysore for the proper care and maintenance of the sluices, gear, measuring instruments, etc., furnished and installed by that Government.

(3) The cost of the special officer and his establishment shall be borne by the Madras and Mysore Governments in equal shares.

(4) It is considered that the cost of installing gauges, measuring instruments and building quarters necessary for the staff should be borne by Mysore as part of the necessities of the project.

The installation of an automatic water level recorder at the Upper Anicut to be paid for by Madras.

50. The Madras Government believe that the proposal that the control of regulation gauging, etc., shall be entrusted to an officer independent of both Governments will immediately commend itself to the Government of Mysore as fair and equitable. It will relieve the Durbar from the invidious and difficult position of being responsible for the fair distribution of supply between its own raiyats and those of Madras, and it will be a guarantee to the public both in Madras and Mysore and to the Government of the French Establishments in India that the working of the reservoir is entirely unbiassed and impartial. It is hoped, therefore that this proposal will prove acceptable to the Government of Mysore and that they will be able to treat it as non-contentious.

51. Finally it is represented that the Mysore Government should furnish to Madras full details regarding their project, *viz.*, working drawings and estimates and reports of all works directly connected with the reservoir, its sluices, the gauging sites and the gauges, instruments and arrangements there proposed. Further the alignment of canals and areas and distribution of irrigation should be communicated as soon as these are decided on. While the latter items are not matters in which the Government of Madras have title to intervene, they cannot be considered matters which do not affect Madras.

52. Under the Agreement of 1892, clause III, *full details* of the projects contemplated must be furnished by Mysore to the Madras Government and so long as this Agreement remains in force it is claimed that Madras have a right to require the strict observance of this clause.

These details are not asked for with any unfriendly object but merely with a view to considering in all its aspects what effect the Mysore project may have on Madras and this is under the Agreement an undoubted right of Madras and it is claimed that full working details of their proposed larger project shall be furnished to the Government of Madras within two years.

53. In view of the controversy which has taken place over this work, it is suggested that the question of suitability and safety of the works proposed so far as they affect Madras shall be decided by the Government of India.

The Madras Government would propose that they should on receipt from Mysore forward to the Government of India the working plans, specifications and full details of the project or part of the project with their remarks, a copy of which should be sent to the Mysore Government and that the Supreme Government should be the final authority as regards the necessity for any modification represented as necessary in the interests of Madras.

54. As regards any proposals for sluices, gauging stations and recording instruments to which the Government of Mysore may wish to have final decision at

an early date and before their full proposals are ready so that they may not be committed to expenditure on proposals not subsequently approved, these, it is submitted, may be sent in separately at any time for acceptance by Madras.

As regards these matters reference to the Government of India shall, it is proposed, only be made if Madras cannot accept the proposals of Mysore.

55. It is further proposed that from the date of the dissolution of the Arbitration Committee that in case of disagreement between the two Governments in regard to measurements of water, sites for measurement or for regarding instruments and generally as regards engineering or other matters in connection with the project and enquiry in which it is claimed by either party that it has a title to be consulted, that such disagreement shall be referred for decision by the Government of India.

56. Finally, as the necessity for the gaugings necessary to finally fix "factors" are the outcome of the neglect of Mysore to take such gaugings before, and to their neglect to observe gauge-readings at anicuts or other suitable places which ordinary prudence and foresight would demand, the whole cost of the gaugings and observations of the next two years shall be borne by the Mysore Government.

After that the cost shall be divided between the two Governments.

In regard to any further gaugings at the Cauvery Dam or Bhavani bridge which the Arbitrator may consider necessary, the Madras Government engage to defray all the cost.

It is considered that this is a matter on which the Arbitration Committee should give an opinion.

W. M. ELLIS, COL., R.E.,
Madras Representative.

5th May 1914.

Enclosure.

Statement of duties and discharges per second for monsoon (85,000 acres) and perennial (40,000 acres) crops during a year.

Case or classification	A				B				C				D				E				F				G				H				K			
	Monsoon crop		Perennial crop		Monsoon crop		Perennial crop		Monsoon crop		Perennial crop		Monsoon crop		Perennial crop		Monsoon crop		Perennial crop		Monsoon crop		Perennial crop		Monsoon crop		Perennial crop		Monsoon crop		Perennial crop		Monsoon crop		Perennial crop	
Month	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs	Acres per cusec	Flow in cusecs
June I ...	...	...	64	625	...	...	64	625	...	...	64	625	...	...	64	521	...	...	64	260	...	...	64	208	...	...	64	156	...	..	64	156	...	...	64	125
,, II ...	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625
July ...	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625
August ...	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625
September ...	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625
October ...	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	71	1,192	64	625	*142*	596	64	625	*142*	596	128	313
November ...	71	1,192	64	625	*160*	799	64	625	*142*	596	64	625	*142*	596	96	417	*142*	596	96	417	*142*	596	128	313	*142*	596	128	313	*142*	596	128	313	*216*	391	64	208
December ...	109	799	64	625	*160*	532	64	625	*216*	394	64	625	*216*	394	96	417	*216*	394	96	417	*216*	391	128	313	*216*	394	128	313	*320*	266	128	313	I *320* / II *Nil.*	*266* / *Nil.*	64	208
January I ...	142	596	64	625	*282*	301	64	625	*282*	301	128	313	*282*	301	128	313	*282*	301	128	313	*282*	301	128	313	*282*	301	128	313	*Nil.*	*Nil.*	128	313	*Nil.*	*Nil.*	64	208
,, II ...	...	...	64	625	..	...	64	625	...	...	128	313	...	...	128	313	...	...	128	313	...	...	128	313	..	...	128	313	...	...	128	313	...	...	Nil.	Nil.
February ...	...	...	64	625	..	...	64	625	...	...	64	625	...	Area reduced by $\frac{1}{4}$.	64	521	...	Area reduced by $\frac{1}{12}$.	64	260	...	Area reduced by $\frac{1}{5}$.	64	208	...	Area reduced by $\frac{1}{2}$.	64	156	...	Area reduced by $\frac{1}{3}$.	64	156	...	Area reduced by $\frac{1}{4}$.	Nil.	Nil.
March ...	...	...	64	625	...	...	64	625	...	...	64	625	...		64	521	...		64	260	...		64	208	...		64	156	...		64	156	...		Nil.	Nil.
April ...	...	...	64	625	...	...	64	625	...	...	64	625	...		64	521	...		64	260	...		64	208	...		64	156	...		64	156	...		64	125
May ...	...	...	64	625	...	..	64	625	...	...	64	625	...		64	521	...		64	260	...		64	208	...		64	156	...		64	156	...		64	125

NOTE.—Duty figures higher than normal introduced on account of scarcity of water are indicated in the statement.
For moonsoon crop by duty figures in italics.
,, perennial crop by duty figures in black type.

1

Exhibit My. 32.

I.

Note on the rules for working the Kannambadi Reservoir.

A set of tentative rules prepared by Mysore is hereto attached for working the reservoir in accordance with the awards on issues 2 and 3.

2. Mysore have been from the beginning stating that, when there is heavy rainfall in the delta area, the demand on canal water would be wholly or partially reduced and that, on such days, the restrictions on impounding should be correspondingly relaxed. Madras too have admitted that such a concession is reasonable, but have only considered the rules put forward by Mysore as unworkable. Mysore, however, maintain that the rules so far as they go, are simple and workable. If any modifications are desirable, they may now be suggested.

3. It is well known that the delta lands are generally flooded in the north-east monsoon, so much so that the crops are damaged in many years. While the river water would thus be of no use to Madras on such occasions, but would, in fact, prove harmful if let into the fields in addition to the rain water, Mysore would be greatly benefited by any concessions on account of rainfall towards extra storage in the north-east monsoon. Accordingly, in the tentative rules for working the reservoir now put forward, a few clauses have been added for giving effect to these concessions.

4. As regards the question how far the rules should be tentative, Mysore have already stated that the two factors fixing the proportion between the flow at Kannambadi and the Cauvery Dam in the two seasons and also the transmission factors for the seasons might be considered tentative. These may be finally fixed after careful observations have been taken for about six years, the average results of which being taken as the final factors in both the cases.

5. For finding the proportions in the two seasons, the stages of flow above 6 feet on Cauvery Dam, shall be taken as no impounding will be done below the limit. The total flow should be computed for each period when the above limit is exceeded. The totals of all such periods should be calculated and taken as the figure representing the total flow at the Cauvery Dam as the basis for fixing the proportions.

The flow at Kannambadi for all the days corresponding to those on which the flow at Cauvery Dam has been recorded as above, should also be computed and the proportions which these totals at the two places bear to each other, should be taken for each year. The average of such observations for six years may then be found and finally adopted.

6. Here it may be stated that proper measures should be taken to find out the correct flow at high stages of the river at the Cauvery Dam as it is understood that the present figures give too low discharges. The correct figures thus arrived at should be taken for fixing these proportions.

7. As regards the factors of transmission losses, it is essential that observations should be taken at three or four selected reaches to make up for different conditions of the bed and sides of the river. A fairly long reach of the river where there is no inflow to vitiate the transmission factor would be the best suited for the purpose. Simultaneous observations at the two ends of each reach so selected would give sufficient data for finding the exact factor due to transmission losses. The factors for the whole series of observations of each year may be fixed for each monsoon and, after completing similar observations for six years, the average of the six years may be struck separately for the two seasons and finally adopted.

Mysore suggest that out of three reaches one may be between Kannambadi reservoir and the confluence of the Kabbani, the second, between junctions of the Bhavani and the Noyel and the third, between the Amaravati junction and the Cauvery Dam.

8. Mysore desire to place on record that these rules based upon the awards on issues 2 and 3 should not be taken as an indication of their final acceptance of the award in every respect and that they are put forward with a reservation that Mysore may make any representation that they think proper to the Government of India.

KARPUR SHRINIVASRAV,
Mysore Representative.

5th May 1914.

II.

Tentative Rules for working the Kannambadi reservoir.

The total flow in the Agunda Cauvery at the Upper Anicut up to a limit of 6·5 feet on the Cauvery Dam equivalent to a discharge of 22,750 cusecs or a limit of 1,966 million cubic feet in 24 hours, shall be considered as the supply due by prescriptive right to Madras according to Rule 3 of the Agreement of 1892 during the months 1st June to 31st January inclusive.

2. All excess flow in the river at the Upper Anicut shall be considered as available for impounding in the Kannambadi Reservoir duly increased by the transmission factor between the Cauvery Dam and Kannambadi.

3. This transmission factor is tentatively taken as 20 per cent and 17 per cent over the flow at Kannambadi, during the south-west and north-east monsoons, respectively, *i.e.*, a flow of 100 at Kannambadi would be represented by 80, when it reaches Cauvery Dam, during the south-west monsoon, and by 83 during the north-east monsoon, and *vice versa*.

From 1st February to 31st May, the flow in the river at Sivasamudram in excess of 900 cusecs, shall be available for impounding in the reservoir, so long as a continuous flow of 900 cusecs is actually utilized for generation of power supply.

4. The impounding in the Kannambadi reservoir during the period 1st June to 31st January, shall be regulated by standard tables I and II accompanying in the following manner:—

(*a*) *South-west monsoon.*—(i) In the south-west monsoon, impounding shall be regulated by table I as soon as the flow at Kannambadi exceeds (0·625 × 22,750 cusecs) 14,219 cusecs provided that the flow in the Agunda Cauvery at the Upper Anicut had exceeded 18,850 cusecs at any time during the preceding four days, equivalent to a gauge-reading of 6 feet on the Cauvery Dam.

(ii) But if the gauge-reading had not so exceeded 6 feet at any time during the preceding four days, the impounding shall be regulated by table II.

(iii) During the period of operation of table II, a change shall be made to table I after Kannambadi flow reaches a rate of discharge of 15,277 cusecs equivalent to 1,330 million cubic feet in 24 hours and continues at that rate for twelve hours, provided also that the Cauvery Dam gauge had exceeded 6 feet at any time during the preceding 4 days the exact time at which the 6 feet limit is exceeded being communicated by telegram. For this purpose the mere gauge-reading on the Cauvery Dam should not be the criterion, but the gauge corresponding to the total flow in the Agunda Cauvery including any discharge through the Upper Anicut sluices.

(*b*) *North-east monsoon.*—Throughout the north-east monsoon, the impounding shall be regulated by table I, provided the discharge at Kannambadi exceeds (·3 × 22,750 cusecs) 6,825 cusecs.

5. The south-west monsoon shall be considered to extend from 1st June to 30th September inclusive, at Kannambadi; and the north-east monsoon, from 1st October to 31st January inclusive, at Kannambadi.

6. The limits above which impounding should commence at Kannambadi in the south-west and north-east monsoons, shall be reduced according to the scale mentioned in the table below on days of heavy rainfall in the delta area :—

Rainfall	Rainfall over whole area		Rainfall over three-fourths area		Rainfall over one-half area	
	Number of days to which the reduced limit applies	Proportion of reduction in limit	Number of days to which the reduced limit applies	Proportion of reduction in limit	Number of days to which the reduced limit applies	Proportion of reduction in limit
				PER CENT		PER CENT
1½ inches	1	Full ...	...	...	...	...
1¾ ,, ...	2	Do ...	1	75	...	...
1⅞ ,, ...	3	Do ...	2	75	1	50
2 ,, ...	4	Do ...	3	75	2	50
2¼ ,, ...	5	Do ...	4	75	3	50
2½ ,, ...	6	Do ...	5	75	4	50

7. For the above purpose, telegrams should be sent to the officer at Kannambadi between the months of June to January on all days on which the rainfall is 1 inch or over. If the rain gauge stations are not telegraph stations, the gaugings may be telephoned to the nearest telegraph station for transmission to the officer at Kannambadi.

8. For determining the river discharges to regulate impounding as above, automatic gauge recorders shall be maintained at the following places :—

(*a*) Above the Kannambadi reservoir—

(1) On the main Cauvery.

(2) On the Hemavati.

(3) On the Lakshmanatirtha.

(*b*) At the reservoir.

(*c*) On the Cauvery below the reservoir.

(*d*) At the Cauvery Dam.

The exact points at which the gaugings should be taken shall be selected by mutual agreement.

9. The gauges at the above places shall ordinarily be read at least twice a day, that is, at 6 A.M. and 6 P.M. But during the floods they should be read at intervals of at least every three hours and communicated by telegram by each party to the other.

10. The gauge registers shall be maintained in printed forms approved by both the parties and copies shall be forwarded by each Government to the other every day.

11. The discharge corresponding to the gauge-readings at the places noted above shall be computed by means of carefully plotted curves arrived at by means of velocity observations specially conducted for the purpose and checked independently by weir discharges wherever possible.

The curves may be revised by mutual consent from time to time by further observations so as to make allowance for change in the *regime* of the rivers.

12. The gauge records and other observations of one Government shall be open to inspection by officers deputed by the other Government.

KARPUR SHRINIVASRAV,
Mysore Representative.

5th May 1914.

Exhibit My. 33.

Note on Working Tables.

Working tables have been prepared on the basis of the awards on the second and third issues for thirteen years 1896 to 1908 and the results of these tables may be here summarised.

2. Full normal conditions of supply with the duties approved by the Assessor for the area proposed to be irrigated under the reservoir, are secured for six out of thirteen years as denoted by the classification A in the fortnightly statement of balances attached.

3. There are two years (1900-01 and 1907-08) in which the supply at the end of October falls short of the full normal requirements by about 2,000 million cubic feet (classification B) and two more years (1896-97 and 1904-05) when the supply falls short of the normal by about 4,000 million cubic feet at the end of October (classification C). But it will be observed that, in all these four years, the closing balance is more than the shortage quantities noted above, even after allowing for a minimum storage of about 3,000 to 4,000 million cubic feet, as a starting balance for the succeeding year. Soon after it was known that extra supplies had been stored in the reservoir, a portion of the same could have been diverted by judicious regulation so as to improve the classification from C to B or B to A.

4. These scales of draw-off, B and C, differ from the normal scale A by a reduction of supplies made quite at the end of the season without any change in the areas of crops. The project provides for raising only a single crop of rice in the monsoon, as is usual in the province ; this requires water for about five months only, though the working tables provide for a supply extending over seven months to meet the contingency of late sowings here and there. Further, there was good rainfall in the month of November in all the years under consideration, except 1904. For these reasons, the reduction due to the introduction of scales B and C would not have affected the condition of the monsoon crops to any appreciable extent.

5. As regards the condition of the perennial crops in these years, the draw-off under scale B is the same as that under scale A ; while the slight reduction in the scale C is confined only to the very last out of twelve months assumed as the crop period. It may be noted that sugar cane usually planted under river channels in Mysore requires water for only ten to eleven months and the slight reduction of supplies made in the twelfth month cannot be said to affect the crop outturn. So it can be safely assumed that in (6+4=) ten years out of thirteen, the reservoir would meet practically all the normal requirements of irrigation both of the monsoon and the perennial crops.

6. There now remain only three years to be considered. Of these, the years 1905-06 and 1908-09 go under classes E and F, although, in the former, the supplies had to be partially curtailed in October. The scale of draw-off for the monsoon crop under cases E and F, is the same as in case C, as can be seen from the duty table. It has been shown above that the reductions as per case C do not materially affect the monsoon crop outturn. So the monsoon crop may be said to be practically unaffected in twelve out of thirteen years. As regards the perennial crop, the reduction in supplies made as per scales E and F, is secured partly by curtailing the new area of perennial irrigation and partly by resorting to supply by turns for the last two out of the assumed twelve months of crop season. All this can be done without any difficulty by timely notices to the cultivators and by proper regulation.

7. Now, coming to the year 1899-1900 the worst on record, it must be admitted that, owing to the scanty rainfall in both the monsoons, the quantity available for storage is very limited, so much so that the reservoir did not at all surplus in that year. Accordingly, the monsoon as well as the perennial crops would get less than their normal supplies. By applying the scale of draw-off K to suit this limited storage, the regulation could be done without much difficulty. It is recognised

that the crops would suffer both in outturn and area in this year. But such a contingency is more or less unavoidable in an exceptionally bad year.

8. In fact, the working tables of the Metur reservoir, which is claimed to have been made sufficiently large to meet the conditions of the bad years, also show similar deficits of storage. In the very years in which the Mysore reservoir conditions necessitate reduced draw-off, the Metur reservoir also shows large *minus* balances (*vide* Volume III, Madras Project, pages 120, 121 and 162). The remarks on pages 13 and 14, Volume I, clearly show that the cultivation would have suffered both in extent and outturn. Similar instances of partial deficits in bad years can be quoted from the big reservoirs in Bombay which are in actual working.

9. No reservoirs are designed to meet such exceptionally bad conditions; and if they were so designed, they would not prove remunerative. The test of success of the present reservoir should also be viewed in this light. Mysore, however have already stated in My. 28 that if, found necessary, they might, at their option, increase the size of the reservoir by about 4,000 million cubic feet.

10. It may be here remarked that the working tables have been based on discharge at Kannambadi computed on certain questionable assumptions, as already stated in Ex. A-3 (*b*). The results of the working tables based on such discharges cannot therefore be taken as giving a true representation of the conditions of actual working.

11. It may be also stated here that, in these working tables, the draw-off for power purposes has been calculated on a basis of 1,000 cusecs at Sivasamudram though the power requirements were estimated in the project on a smaller discharge at Sivasamudram corresponding to 1,000 cusecs at the reservoir. The quantity now allowed in the working tables on the basis of 1,000 cusecs at Sivasamudram thus increases the power draw-off by more than 25 per cent. as can be seen from the attached statement B, column 4. This matter has been fully explained in My. 19 and although this representation with all the facts and figures supporting it was not favourably considered and a ruling contrary to the project provision was recorded, the fact still remains that the project as prepared by Mysore does not provide for passing 1,000 cusecs at Sivasamudram, as such a flow would mean the generation of a much larger amount of power than is contemplated in the Mysore project.

12. Accordingly, if the working tables made on a basis of a larger draw-off for power than allowed in the project show that the reservoir would not fully meet the normal demand in some exceptionally bad years, the results of such years cannot evidently be taken as an argument against the success of the reservoir.

13. If, however, the provision actually made in the project, *viz.*, 1,000 cusecs as at Kannambadi, be taken as the basis, then the storage requires at the end of October or September for the different scales of draw-off A to K, would be reduced by about 3,500 m.c.ft. in each case as shown below:—

Scale of draw-off	As per ruling	As per project	Storage at the end of
A	33,500	30,000	October.
B	31,500	28,000	,,
C	29,500	26,000	,,
D	27,500	24,000	,,
E	25,500	22,000	,,
F	23,500	20,000	,,
G	26,500 or less	23,000 or less	September.
H	24,500 ,,	21,000 ,,	,,
K	20,000 ,,	17,000 ,,	,,

14. Working on the basis of scales altered as per project, it will be found that the reservoir would fully meet all normal demands as in class A, in eleven out of thirteen years, as indicated by black letters in statement A attached, while one year would fall under class D. But, in the single year 1899-00, when the rainfall was abnormally low, the scale of draw-off as per class H would have to be resorted to against class K according to the working tables on the basis of the extra draw-off for power. Thus it is clear that, judged on its own merits, apart from the ruling necessitating an increased draw-off for power in the working tables, the project as prepared by Mysore fulfils practically all the requirements except in only one out

of thirteen years. Agreeably to the remarks in paragraph 9 above, the project deserves to be accepted in every way as having been prepared on a sound and practical basis.

15. As regards the precautions to be adopted for ensuring a non-infringement of the Madras rights during the working of the reservoir, all that is necessary has been stated in My. 28. Mysore once more repeat that it would be their special concern to see that the gauging operations and regulation of the sluices are conducted strictly according to the rules that may now be framed and approved. There could therefore be no cause for apprehending that the passing down of the water due to Madras will in any way be prevented by the working of the Kannambadi reservoir.

16. It should be stated here that these working tables have been produced only with the object of giving some idea of what may be expected from the reservoir and cannot be binding on Mysore. The utilization of the storage must depend on the exigencies of demand for power supply and irrigation. The stored water would be utilized for whatever purposes Mysore may find it most paying. It is therefore needless to state that Mysore would be at liberty consistently with the protection of Madras prescriptive rights to alter the distribution of crop area, draw-off for different purposes and all such internal arrangements.

KARPUR SHRINIVASRAV,
Mysore Representative.

5th May 1914.

Statement A.

Statement showing balance at end of each fortnight from 1896 to 1908.

Fortnight		A 1896-97 C	A 1897-98 A	A 1898-99 A	H 1899-00 K	A 1900-01 B	A 1901-02 A	A 1902-03 A	A 1903-04 A	B 1904-05 C	B 1905-06 H & E	A 1906-07 A	A 1907-08 B	D 1908 F
1		2	3	4	5	6	7	8	9	10	11	12	13	14
June ...	I	3,000	9,099	5,577	15,203	92	5,411	12,046	20,690	2?,293	8,170	4,995	11,069	10,259
	II	37,080	22,334	7,652	21,442	16,421	5,208	9,565	18,175	37,080	5,705	4,178	9,121	7,773
July ...	I	37,080	36,993	5,205	29,736	37,080	37,080	30,719	28,447	36,898	8,541	1,754	11,683	21,677
	II	37,080	37,080	24,598	27,045	37,080	37,030	36,016	37,080	34,308	31,798	37,080	37,080	37,080
August ...	I	37,080	37,080	28,056	24,783	37,080	37,080	33,472	35,821	37,080	29,750	34,532	37,080	36,740
	II	35,882	36,910	25,365	22,119	35,612	35,380	30,783	36,591	34,362	27,071	37,080	36,910	34,024
September ...	I	33,332	34,728	26,328	19,609	33,366	32,839	37,066	34,038	33,133	24,556	35,025	34,357	31,480
	II	30,793	31,512	27,302	17,528	30,828	30,298	34,568	32,501	30,538	22,032	32,477	32,310	28,913
October ...	I	32,068	34,420	36,406	16,229	30,082	32,689	36,951	36,230	28,007	25,523	35,886	31,765	26,425
	II	29,358	33,515	34,870	14,847	30,848	36,404	34,233	36,379	28,630	25,737	34,297	30,516	23,978
November ...	I	27,596	30,698	37,080	13,953	29,018	36,199	33,472	37,080	26,872	24,248	31,753	30,389	22,648
	II	28,034	28,432	34,694	13,062	27,248	36,229	30,929	37,080	25,121	22,768	29,217	28,360	21,262
December ...	I	26,549	26,419	32,666	11,697	25,952	34,194	36,544	35,585	23,645	21,564	27,365	26,691	20,210
	II	24,971	24,280	30,511	10,614	24,574	32,032	34,373	33,417	22,079	20,286	25,397	24,920	18,713
January ...	I	24,023	22,544	28,693	9,041	23,203	30,263	32,607	31,654	21,129	18,840	23,897	23,567	...
	II	23,434	21,523	26,742	7,614	21,660	29,040	31,623	30,604	20,537	18,192	23,483	22,546	...
February ...	I	22,762	20,419	25,067	6,315	19,809	26,989	30,463	30,170	19,509	17,251	22,429	21,350	...
	II	21,202	18,718	23,537	5,319	18,077	25,045	29,006	29,612	17,968	15,978	20,764	19,521	...
March ...	I	19,381	17,220	21,339	4,514	16,164	23,034	27,277	28,384	16,274	14,394	18,913	17,531	...
	II	17,407	14,991	19,010	3,603	14,004	20,651	25,227	26,900	14,024	12,522	16,720	15,391	...
April ...	I	15,282	12,646	17,861	2,780	11,850	18,617	22,973	25,535	11,901	10,611	14,957	13,411	...
	II	13,944	10,619	18,884	2,669	9,923	16,555	20,814	24,266	9,997	8,664	14,242	12,756	...
May ...	I	11,383	8,733	16,709	2,224	7,926	14,757	19,179	23,690	8,145	7,766	13,245	12,631	...
	II	10,652	6,870	14,366	1,441	6,421	13,416	21,674	26,032	9,235	6,548	12,174	11,842	...

Statement B.

Months	Case A. On Sivasamudram basis, as per ruling by the Assessor — 33,500 m.c.ft. at the end of October				Case A. On Kannambadi basis, as per project provision —			
	Draw-off for monsoon crop	Draw-off for perennial crop	Draw-off for power	Evaporation	Draw-off for monsoon crop	Draw-off for perennial crop	Draw-off for power	Evaporation
September	...	...	...	...	...	...	...	...
October	3,193	1,674	...	..	3,193	1,674	...	...
November	3,090	1,620	...	...	3,090	1,620	...	...
December	2,129	1,674	...	...	2,129	1,674	...	...
January, 1st half	772	810	506	...	772	820	126	...
,, 2nd half	...	864	80	...	...	864		...
February	...	1,512	1,263	...	...	1,512	641	...
March	...	1,674	2,383	...	...	1,674	1,653	...
April	...	1,620	2,786	...	...	1,620	2,113	...
May	...	1,674	2,103	...	...	1,674	1,458	...
June, 1st half	...	810	1,122	...	...	810	742	...
Total draw-off after end of October...	5,991	12,258	10,243	2,320	5,991	12,258	6,733	2,320

	Storage at the end of October		Storage at the end of October
Case A	33,500	Case A	30,000
,, B	31,500	,, B	28,000
,, C	29,500	,, C	26,000
,, D	27,500	,, D	24,000
,, E	25,500	,, E	22,000
,, F	23,500	,, F	20,000
	Storage at the end of September		Storage at the end of September
Case G	26,500	Case G	23,000
,, H	24,500	,, H	21,000
,, K	20,000	,, K	17,000

N.B.—The power demand has been based on the recorded Sivasamudram discharges for 1906.
(i) For the Sivasamudram basis, the draw-off from the reservoir for power is D=¾ (1,000—S) where S is the flow at Sivasamudram.
(ii) For the project provision basis, D=(1,000—⅔ S) where S is the flow at Sivasamudram.

1

Exhibit My. 34.

Note on the provision made in the project for power supply.

The provision for power discharge made in the project for the final stage is 1,000 cusecs as at Kanṉambadi and not at Sivasamudram—*vide* table II on page 31 of the project.

2. The total quantity of power water to be let out from the reservoir at Kannambadi comes to 6,352 m.c.ft.—*vide* paragraph 18, page 4 of the project.

3. This quantity of 6,352 m.c.ft. tallies nearly with the quantity (6,700 m.c.ft.) now arrived at by taking 1,000 cusecs as at Kannambadi, as shown in statement B attached to My. 32.

4. If 1,000 cusecs at Sivasamudram be taken as the basis, the quantity of water to be reserved in the reservoir for power calculated on the discharges of the worst recorded summer comes to 10,240 m.c.ft., against only 6,352 m.c.ft. provided in the project.

5. The storage available in the same summer season with 1,000 cusecs at Sivasamudram, is *nil* as against the expenditure from the reservoir of 10,240 m.c.ft. to maintain this large flow of 1,000 cusecs at Sivasamudram.

6. The corresponding storage available in summer with 1,000 cusecs as at Kannambadi would be 53 m.c.ft. against an expenditure of about 6,700 m.c.ft.

7. Madras demanded 900 cusecs flow because 1,000 cusecs was provided in the project. The quantity should evidently be taken in the same terms in which it was intended and specified in the project.

8. The award of 900 cusecs too should be taken in the same sense in which 1,000 cusecs has been provided in the project. This sense has been shown to be that the 1,000 cusecs should be taken as at Kannambadi and not at Sivasamudram.

9. It is true that Madras referred to Sivasamudram as the place of flow in their demand, but this has been shown to be based on insufficient information.

10. Mysore did not specifically contradict Madras regarding the demand of 1,000 cusecs at Sivasamudram, because:—

(*a*) Mysore always objected to the very principle of the Madras demand being based on the naturally varying power supply and not on their prescriptive right for protecting their hot weather irrigation; and

(*b*) they had no reason to believe that the project already put in as an exhibit would not be duly examined before arriving at a final decision.

11. When the award was against both the above natural courses, Mysore, in their Exhibit My. 19, took the earliest opportunity of clearly explaining the provision in the project to arrive at a proper basis for preparing the working tables.

12. The ruling given by the Assessor may, on a proper examination of the figures presented, be altered, to be in keeping with the project, as has always been done by the Assessor, whenever any errors in professional matters have been pointed out by either party.

KARPUR SHRINIVASRAV,
Mysore Representative.

7th May 1914.

Exhibit Ma. 36.

Remarks of Madras Government with reference to Mysore note on "Rules for working the Kannambadi Reservoir, My. 32."

Reference-Mysore paragraphs 1 to 3.

The rules to be framed with a view to give effect to the working of the principles of the award on the Issue 3 (*a*) have, for purposes of convenience, been, by consent, transferred for consideration to Issue 3 (*b*) and it is considered that the question of rainfall in the delta area in Tanjore is not a relevant consideration and the rules aim at merely the giving to Madras the full natural flow of the Cauvery from June to January up to a limit of 6½ feet on the Cauvery Dam and nothing else.

Reference-Mysore paragraph 4.

2. The Madras Government urge that, for the reasons given by them (Ma. 35), four years should be fixed subject to extension, if considered necessary by the Government of India, and note that Mysore agree to this.

Reference-Mysore paragraph 5.

3. The Madras Government altogether object to the suggestion of Mysore that proportion factor figures should be fixed by adding up the total flow of the river above a certain stage in various seasons for six years and fixing factors in accordance with totals.

It is only by considering half-monthly and daily flow extending *over all the periods for which gauge-readings will be available* at the end of the tentative period, that proportion factors can equitably be fixed on a basis calculated to fully secure to Madras the full enjoyment of the natural flow of the Cauvery up to the limit of the award on Issue 2 (*b*).

Reference-Mysore paraaph 6.

4. It is further represented that the high stage flow of the Cauvery has no material bearing on the matter of fixing proportion factors calculated to give to Madras undisturbed all natural flow up to the limit flow of the award.

Reference-Mysore paragraph 7.

5. The suggestions of Mysore as regards the means of ascertaining the factor for losses in transmission are not accepted; it is not considered that any reliable results could be obtained from the measurement of discharges in the reaches proposed by Mysore.

The Government of Madras represent that it is by study and comparison of the discharges at various places notably at Kannambadi and Sivasamudram, Bhavani Bridge and the Upper Anicut, that a suitable percentage factor can best be fixed but that any determination of a percentage factor of loss in transmission on a basis of exact measurement is impracticable. The best method of fixing both proportion and percentage factors is by application of trial combinations of factors to ascertained conditions of discharges at the various places.

The three reaches regarding which measurements for losses in transmission are proposed by Mysore are :—

(*a*) between Kannambadi and the confluence of the Kabbani;

(*b*) between the confluence of the Bhavani and the confluence of the Noyel;

(*c*) between the confluence of the Amaravati and the Upper Anicut.

There are large areas of irrigation fed by channels taking off from each and all of these reaches. If these reaches are gauged, deductions from the measured draw-off of each of these channels would have to be made.

The results of the measurements suggested would, it is submitted, be utterly unreliable and the cost and difficulties of taking the observations proposed will in no case be repaid in the value of the results.

6. It is not open to question that, under the conditions of arbitration, both parties have full right to make representations to the Government of India on the matter of the awards given and the Madras Government proposals are put forward with similiar reservations to those expressed by Mysore.

Reference-Mysore paragraph 8.

7. *Remarks on tentative rules proposed by Mysore* (*My.* 32).—The following rules are objected to by Madras.

Paragraphs 6 and 7 (My. 32) of Mysore tentative rules re-numbered III and IV at the Assessor's meeting of 7th May 1914. The matter of rainfall in Madras is irrelevant in these rules which are designed to meet Issues 2 and 3 (*a*) which awards do not deal with such a matter—*vide* also paragraph 1 above.

The other rules of Mysore as amended at the above Assessor's meeting are accepted for incorporation in the award rules. The amendments made included striking out altogether paragraphs 1 to 3 of the Mysore tentative rules.

8. *The contentious matter in Draft Rules of Madras* (*Ma.* 35):—The draft rules of Madras (Ma. 35) as amended at the Assessor's meeting of 7th May 1914 are accepted by Mysore with the exception of the following:—

III (*a*) last clause, III (*b*), III (*c*) and IX.

Other minor modifications proposed by Mysore in rule III (*a*), first clause (and in rule VII to agree with the former) are accepted by Madras.

9. The contentious matter in the last clause of rule III (*a*) is already dealt with in the Madras Note Ma. 35, paragraph 5, and it is submitted that, under the explanation there given, the rule should be upheld.

10. As regards rule III (*b*), it is urged that the limit of extension of direct irrigation from channels taking off from the Cauvery in Mysore as well as in Madras has been already reached.

By this it is not implied that no minor extensions are possible by gradual improvement, but it is certain that no large extensions are practicable except by means and through the instrumentality of the Mysore reservoir.

11. The supply due to Madras is to be determined by fixing the factor showing the proportion which the flow at Kannambadi under existing conditions bears to that at the Cauvery Dam. The factor will be fixed on the basis of existing draw-off and area irrigated in Mysore. Of the water passed through the dam under the application of the factor, the existing irrigation has a little to supply and, so long as no additional water is used for supply of lower irrigation, the factor covers the supply of this. The existing channels were, however, constructed without any regard to economy and when flowing full carry water at a very low duty and thus during the flow season June to October give superabundant supplies to the areas much of which supply returns to the river and is again utilised.

12. The irrigation duty of the Mysore Cauvery channels gauge by flow at the head is less than 30 acres to the cusec, while the actual duty is probably from 50 to 70 acres per cusec and the balance of water returns to the river.

It is proposed by Mysore to greatly extend these channels which can take in at the head much more water than is actually utilised for irrigation and to do this without any necessity for enlarging the head sluices or upper reaches, while the extended irrigation, late in the season, will be protected and supplied by the reservoir.

13. Such extensions will in so far as they utilize and permanently withdraw from the river more water than was previously withdrawn, must draw this extra water from the allowance due to Madras under the award unless this extra amount of water is added to the supplies passed through the sluices.

14. The Mysore contention is that if they do not increase the size of their head sluices they may extend to any area and that such extension will be merely due to natural extension and increased economy of distribution. While it may be admitted that natural extension, say, up to 5 or even 10 per cent., may be reasonable result of economy and improvement, it is submitted that this is the full limit of extensions due to such a cause and that all further extensions for which a definite supply of water is not passed in addition to what is due by the application of the proportion factor is passed at the expense of Madras supplies.

15. In proof of the low duties for which the old channels in Mysore are excavated, reference is invited to Captain Dawes' Cauvery Project, Part II, page 11, where he says " the capacity of a tank is always reckoned in this State as 6 feet head over an acre of land whereas the duty of channels is taken as 30 acres per cubic foot per second."

Can it be doubted that the narrow strip of marginal cultivation under channels supplied at such duties return considerable quantity of water to the river?

16. The area of irrigation in the Cauvery below Kannambadi is 39,000 acres and allowing for a natural increase of 10 per cent, 4,000 acres could be realized and to such an increase as a natural expansion Madras would not object. It is, however, contemplated to extend the lower channels under the protection afforded by the reservoir by 25,000 acres—*vide* Mysore Project, paragraph 31, and it is urged that, if no allowance is to be made under the rules for water to supply this, the water must come from the Madras allowance.

17. This is the reason for the proviso in rule III (*b*) and it is claimed that in equity it should be upheld.

18. *Rule III* (*c*).—In this rule it is proposed that the duty allowances should be gauged at the actual measured duties realised in raising crops and diminished by 10 per cent to allow for increased efficiency of distribution. If the duties now realised are low, as no doubt they are, such allowance should be raised in accordance with actuals when the duties are improved, but it is contended that actual measurement and not assumption should be the basis of the allowances.

19. As regards rule IX, the reason and condition of its inclusion in the rules are given in Ma. 35, paragraph 6, and it is submitted that some such rule is absolutely called for if the Arbitrator rules that success or failure of Mysore Project is a matter in which Madras interests are involved.

20. Apart from the actual draft rules and paragraphs of the Madras note (Ma. 35), the Mysore Representative has accepted as non-contentious all the matter in Ma. 35 except the following:—

(*a*) *Ma.* 35, *paragraphs* 25 *to* 37.—This relates to the working tables of Mysore Reservoir and is dealt with separately (Ma. 37).

(*b*) *Ma.* 35, *paragraph* 41.—The proposal of Madras for gearing several sluices together is objected to and is dropped by Madras. The rest of the proposal is accepted by Mysore.

(*c*) *Ma.* 35, *paragraph* 49.—*Controlling agency.*—In this matter the Government of Madras cannot but consider that their reasonable proposition has not been received by Mysore with the consideration it deserves, and urge on the Arbitrator that, in a matter of such extreme importance, independent controlling agency is essential to the proper working of the scheme and the satisfaction of the very numerous interested parties.

If, however, the Mysore proposal is accepted, it is represented that it is essential it shall be open to any officer of the Madras Government, duly authorised in this behalf, at any time and without notice to inspect the reservoir sluices or gauging stations, recording instruments, etc., and to satisfy himself if he wishes by actual measurement of the accuracy of gaugings at any station and of the regulation of sluices and discharges and the accuracy of the record of the same maintained, and he shall be given every assistance by the Mysore Government in carrying out such duty.

Except as regards the controlling officer and staff being independent of both Governments, Mysore have accepted the proposals in Madras paragraph 49.

(*d*) *Ma.* 35, *paragraph* 51, *last clause and* 52.—The Government of Madras maintain their right under the Agreement of 1892 to be afforded full information regarding the Mysore Project.

(*e*) *Ma.* 35, *paragraph* 56.—The Government of Madras withdraw the claim to the payment by Mysore of all the salaries or expenses of the joint staff of the gauging parties. Each party shall pay the salaries of their own servants. The expenses of installing gauging stations, furnishing boats and materials, etc., shall be paid by Mysore. It is understood this is not contentious.

W. M. Ellis, Col., R.E.,

8th May 1914. *Madras Representative.*

Exhibit Ma. 37.

Reply by the Government of Madras to Mysore Note on Working Tables (My. 33).

It is submitted that the conditions under which the working tables of the Mysore Reservoir were to be drawn with a view of showing the extent of success or failure of the project were the matter of full discussion and settlement prior to the drawing up of such tables. The areas to be irrigated and the duties and system of draw-off were all those proposed by Mysore with the exception of the duty for perennial crop which was after discussion fixed by the Assessor.

2. These duties were fixed on a scale which certainly connote economical management and good design of a distribution system and that failure to supply the full area at such duties indicates loss to a greater or less extent.

3. The classification of duties as arranged by Mysore on the basis of the supply actually impounded on the last day of October is a reasonable arrangement as it is almost certain that no further supply would be received after that date until February and by that time the area of perennial crop to be cultivated must be fixed and the issue of water to monsoon crop has closed.

The suggestion of Mysore that the man on the spot could effect material economies by abandoning the rules drawn for his guidance is not in accordance with fact or possibility and is unsupported by a single instance in which such could have been done, and it is denied that any material amelioration of the position could have been made in the bad years by the man on the spot.

4. In paragraph 4 (My. 33) Mysore suggest that the high duties which they have themselves put forward for supply of the monsoon crop during the last two and a half months of the seven months crop season can be reduced without inconvenience or loss of crop on the ground that the crop is really about a five months' crop and seven months water is only allowed to provide for late sowings.

It is, however, to be noted that Mysore have already, in proposing their duties, explained and justified the quantities of water allowed in the full duties agreed to on this basis and it has already been admitted that the water is only allowed on the basis of a five and a half months' crop and only under this explanation as regards late sowings and that the crop to be raised was a five and a half months' crop and not a seven months' crop, Madras accepted these duties—*vide* Mysore 25.

It was on this basis that duties of the monsoon crop were accepted by Madras and this cannot again be accepted as a pretext for still further reducing the duties fixed on a basis of a 5½ months' crop.

5. It is suggested that failure might be mitigated by reducing the balance at the end of the season.

The proposals of Mysore for regulation are on a basis of leaving at the end of the season 4,000 million cubic feet balance [My. 19 (*a*)] as it is not safe to commence the issue for the following year to monsoon crop with a balance of less than this and the Mysore rules provide for this. Further, a balance is required as a working margin as there is an absolute necessity to secure power supply against failure and it is on this recognised necessity that the working rules of Mysore are drawn. They are properly based on the recorded inflow, February to May, of a bad year, as only this can give security and it is not safe for the officer on the spot to make any change at least until after the end of April by which time it would be too late to materially alter the situation. If Mysore had desired that, in the event of the impounded balance being a certain quantity at the end of April, different duties should be worked to, they should have provided for this in their rules. Such provision, however, could make no material alteration in the results displayed by the working tables.

6. The failures under scales B and C are classed by Madras as "*minor* failures", but it is submitted that although minor they are quite material. The monsoon crop duties are reduced in these years after the end of October to one-half the scale that can be successfully worked to, and some loss of crop would be suffered and also material reduction in "outturn." These remarks apply to the four years of minor failures, *viz.*, 1896, 1900, 1904, 1907. The statement by Mysore that there was good rainfall in all these years except 1904 in November is not borne out by the examination of the rain registers of Mandya and Krishnarajpete.

The rainfall recorded is noted below:—

November rain.

	Mandya.	Krishnaraj-pete
	INCHES.	INCHES.
1896	2·62	5·05
1900	0·3	0·93
1904	1·06	*Nil.*
1907	1·65	2·55

The average November rainfall of Mandya is 3·3 inches.

7. Referring to the statement called for by the Assessor regarding the deficiencies in supplies passed to crops in comparison with supplies aimed at under full duties (class A duties). In these years the deficiencies on the whole years' supply and for the period after the full duties are reduced, are, that is, from 1st November, shown below.

The conditions of working entail on Mysore reducing duties from the end of October for the rest of the year if balance impounded at that time does not justify continuance of full duties.

	Percentage reduction of duty supplies, whole year	Percentage reduction of duty supplies, 1st November to 15th June
1896	9·6	21
1900	15·0	33
1904	9·6	21
1907	5·2	11

It is submitted that, in the face of these figures, it cannot reasonably be contended that the failure in these years was negligible.

8. Coming to the year of "Medium failure", *viz.*, 1905-06, as regards the monsoon crop, the duties, 1st October to 15th January, are increased from normal scale *A* as below —

	A scale acres per cusec	Reduced scale acres per cusec
October	71	142
November	71	142
December	109	216
January first-half	142	282

That is, for three and a half months out of a total of seven months, the supplies are just one-half of what on an already high duty-scale they ought to be.

The rainfall for this year at Mandya was:—

	Inches	Average
October	3·99	7·0
November	·18	3·3
December	*Nil*	0·92

Coming to the perennial crop, the area is reduced by seven-twelfths, that is, by 58 per cent, from 1st February, while the normal supply of water to the area on the ground up to that date was reduced for three months, November to January, by 40 per cent. Under these conditions, can it be considered the failure was other than serious ?

9. Now, examining the year 1908-09, for the monsoon crop, the scale of water-supply given from 1st November to 15th January was, as in the year examined above, only one-half the normal duties accepted as necessary.

The rainfall at Mandya in the centre of the irrigated tract was—

	Inches
October	2·76
November	*Nil*
December	*Nil*

The perennial crop.—The area planted in February is reduced below normal area (*A* class) by 66 per cent., while the supply of water to the area of perennial crop on the ground is reduced for three months from November to January to one-half the normal. Such a year cannot, it is contended, be classed as other than one of serious failure.

10. The year 1899-1900 is admitted by Mysore to be one of very disastrous failure and nothing more will be said about this.

11. It is submitted that the assumptions of duties for crops and daily flow have been settled prior to working out these tables on the best available data and it was agreed that the results as displayed in the tables should be the criterion and standard by which the success or failure of the reservoir should be gauged.

If, under this, the success of Mysore reservoir project had been shown to be reasonably well secured, the Government of Madras would not have attempted to contend that because the duties fixed were too high and it is believed they are too high, and because the daily discharges, although the best procurable, are not fully reliable that the consent to construction of the reservoir should be withheld. The tables on the basis of working settled beforehand have been agreed on as the criterion of success or failure and the Government of Madras urge that the error, if any, is fully as likely to be on one side as the other and that the decision as regards failure or success should be judged from the standards agreed on before the tables were drawn.

12. In accordance with the Assessor's instructions, the difference in the results which the tables would exhibit if the draw-off for power were reduced from 1,000 cusecs to 900 cusecs, have been examined and they are found not to materially affect the matter.

There is, however, a discrepancy between the Madras results as regards this and those of Mysore and it is asked that after this is reconciled that the Madras table on this matter may be submitted with remarks.

13. A table has also been drawn out at the desire of the Assessor showing the closing balances in Mysore reservoir at the end of each irrigation year (15th June), the issues to irrigation and the deficiency of such issues from normal requirements of areas and duties (class *A*) and the percentage deficiency of issues each year to the class *A* standard.

A similar table is made having reference only to the water required at the normal (Class *A*) duties from 1st October or 1st November to 15th June (this being the period of reduced supply) and the water issued year by year and the percentage deficiency.

In both cases the deficiency from the already high duties is very material and, it is submitted, shows failures of a nature fully justifying Madras contentions.

If there are discrepancies of a serious nature between these statements and those of Mysore, the consideration of these statements may be postponed till these differences are reconciled or explained.

W. M. Ellis, Col., R.E.,
Madras Representative.

8th May 1914.

Exhibit Ma. 37-1.

Statement showing balance in Mysore Reservoir on 1st June of every year with quantity received and issued during the year.
(Check of Mysore statement.)

Years	Balance on 1st June	Quantity actually stored in the irrigation seasons up to January	Quantity stored from February to May	Total of columns 2, 3 and 4	Expenditure				Balance	Case	Balance at the end of October	Shortage in irrigation supply	Surplus
					Irrigation	Evaporation	Power	Totals of columns 6, 7 and 8					
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1896-97	4,000	50,697	1,830	56,527	35,281	4,126	6,642	46,049	10,478	C	29,372	3,835	
1897-98	10,425	47,904	567	58,896	39,926	4,093	7,920	51,939	6,957	A	33,495	...	
1898-99	7,009	57,062	2,777	66,848	39,926	4,072	8,375	52,373	14,475	A	34,870	...	
1899-1900	14,388	22,471	1,274	38,133	23,803	2,817	9,837	36,457	1,676	K	14,917	16,123	
1900-1901	1,510	52,061	689	54,260	33,106	3,761	12,238	49,105	5,155	B	30,871	6,820	
1901-1902	5,181	60,400	439	66,020	39,926	4,661	4,218	48,605	17,415	A	36,573	...	
1902-1903	17,416	51,833	3,593	72,842	39,926	4,716	6,423	51,075	21,767	A	34,228	...	
1903-1904	21,412	45,879	5,381	72,672	39,980	4,787	1,124	46,090	26,582	A	36,376	...	
1904-1905	26,312	26,698	2,412	55,422	36,076	4,167	5,597	45,840	9,581	C	28,637	3,850	
1905-1906	9,581	38,932	13	48,526	29,602	3,496	9,311	42,409	6,117	H & E	26,145	10,324	
1906-1907	6,054	52,816	998	59,868	38,376	3,924	5,337	47,637	12,231	A	34,276	1,550	
1907-1908	12,219	44,471	1,997	58,687	37,864	4,205	4,719	46,788	11,899	B	30,520	2,062	
1908-1909	11,954	36,718	...	48,672	26,722	2,156	1,109	29,987	18,685	F	23,986	4,277	

Exhibit Ma. 37-2.

STATEMENT showing balances at end of each half month for years 1896 to 1908.

Years	1896—1897	1897—1898	1898—1899	1899—1900	1900—1901	1901—1902	1902—1903	1903—1904	1904—1905	1905—1906	1906—1907	1907—1908	1908—1909
Classification	C	A	A	K	B	A	A	A	C	H E H D	A	B	
June first-half ...	4.000	8,872	5,737	15,282	221	4,163	15,405	20,422	25,307	8,525	4,490	11,107	10,376
		9,934	6,911	16.567	2,866	5,692	16,765	21,376	25,910	9,589	3.972	11,658	11.535
„ second-half ...	37,080	22,114	7,824	21,525	16,704	3,966	12,904	17,877	37,080	6,065	5,328	9,161	7,901
		21,067	8.998	22.810	17,921	5,480	14.269	18,841		7.114	4,810	9,712	9,045
July first-half ...	37,080	36,994	5,394	29,826	37,080	37,080	33,407	26,926	36,899	8,903	2,913	11,732	21,446
			6,553	31.096			34,772	27,880		9,952	2,395	12,283	22.590
„ second-half ...	37,080	37,080	21,791	27,138	37,080	37.080	36,011	37,080	24,683	32,124	37,080	37,080	37,080
			25.950	28,408						33.173			
August first-half ...	37,080	37,080	28,260	24,870	37,080	37,080	33,461	35,820	37,080	30,085	34,700	37,080	36,740
			29,419	26,140						31,134			
„ second-half ...	35,886	36,910	25,572	22,198	35,612	35,380	30,767	36,595	34,360	27,424	37,080	36,910	34,023
			26,731	23,468						28,473			
September first half ...	33,336	34,729	26,556	19,693	33,377	32,830	37,066	34,045	33,069	21,918	35,030	34,360	31,473
			27,700	20.963						25,967			
„ second-half ...	30,786	34,473	27,534	17,614	30,842	30,295	34,575	32,505	30,534	22,413	32,480	32,340	28,938
			28,678	18,884						23,447			
October first-half ...	32,076	34,391	36,408	16,309	30,102	32,677	36,948	36,235	28,014	25,920	35,892	31,770	26,418
				17,579						26,939			
„ second-half ...	29,372	33,495	34,870	14,917	30,871	36,573	34,228	36,376	28,637	26,145	34,276	30,520	23,986
				16,187						27.168			
November first-half ...	27,500	30,960	37,080	14,017	29,056	36,213	33,461	37,080	26,889	24,667	31,726	30,400	22,658
				15.287						25,686			
„ second-half ...	27,776	28,125	34,700	13,117	27,256	36,230	30,926	37,080	25,141	23,201	29,191	28,375	21,375
				14.387						24.208			
December first-half ...	26,291	26,392	32,660	11,752	25,306	34,190	36,544	35,584	23,671	22,001	27,338	26,710	20.235
		26.402		13.022	25.347					23,008	27,226		20.325
„ second-half ...	21,618	21,264	30,500	10,664	24,505	32,020	34,368	33,424	22,103	20,680	25,378	24,950	18,639
	24.588	24.254		11,941	23.706	32,030				21,699	25,130		18,291
January first-half ...	23,673	22,521	28,680	9,096	21,916	30,258	32,606	31,661	21,165	19,252	23,882	23,600	
	23.643	22.514	28,730	10,503	22,297	30.268			21,173	20.432	23,615		
„ second-half ...	23,081	21,516	26,735	7,671	20,421	29,218	31,550	30,605	20,582	18,623	24,3 2	22,576	.....
	23.051	21.506	26.945	9.243	20,932	29,228			20,597	19.817	22.89o		
February first-half ...	22,156	20,134	25,062	6,367	18,577	28,287	30,337	30,254	19,586	17,691	22,312	21,333	.....
	22,496	20.561	25.402	8,079	19,228	28,351	30,497	30,299	19,751	18,682	22,017	21,514	
„ second-half ...	20,916	18,748	24,543	5,377	16,834	26,978	28,891	29,753	18,055	16,415	20,682	19,503	.....
	21,096	19.015	24.013	7,195	17,610	27,205	29,134	29.856	18,350	17,231	20.497	19.834	
March first-half ...	19,106	17,269	21,353	4,574	14,923	24,987	27,178	28,503	16,367	14,818	18,833	17,525	.....
	19.426	17.676	21,973	6,517	15,849	25,364	27,568	28,763	16,812	15,477	18,798	18.006	
„ second-half ...	17,170	15,006	19,621	3,672	12,771	22,647	25,146	27,019	14,126	13.001	16,610	15,405	.. ...
	17.650	15.633	19.801	5,759	13.841	23,184	25,696	27,440	14,731	13,430	16,735	16,110	
April first-half ...	15,083	12,713	17,879	2,839	10,608	20,505	22,902	25,655	12.010	11,092	14,866	13,419	.....
	15,675	13,460	18,754	5,036	11,823	21,173	23,602	26,158	12,765	11.334	15,131	14.289	
„ second-half ...	13,749	10,733	18,900	2,738	8,694	19,618	20,712	24,390	10,125	9,150	14,064	12,816	.....
	14.491	11.600	19.815	5,035	10,031	20,298	21.562	24,953	11,030	9.205	14,368	13 723	
May first-half ...	11,186	8,858	16,726	2,081	6,691	18,678	19,117	23,832	8,294	7,257	12,959	12,730	.....
	12,076	9,865	17,776	4,501	8,176	19,412	20,052	24,425	9,304	7,122	13,343	13,697	
„ second-half ...	10,425	7,009	14,388	1,510	5,181	17,416	21,412	26,312	9,581	6,051	12,219	11,954	.....
	11,417	8,130	15,583	4,060	6,777	18,655	22,366	26,915	10,601	5,719	12,718	12.958	

N.B.—Figures in black type denote balance with power requirements 900 cusecs. Other figures with power requirements as 1,000 cusecs.
Note.—All black type figures from December 1896 to June 1897 should be increased by 60.

Exhibit Ma. 37-3.

STATEMENT showing opening balances, receipts, issues and differences.

Year	Class	Opening balance on 15th June	Receipt during year	——	——	Percentage of deficiency
1	2	3	4	5	6	7
1896-1897	C	4,000	48,967	36,091	3,835	9·6
1897-1898	A	8,872	48,113	39,926	.....	.....
1898-1899	A	5,737	59,753	39,926	.....	.....
1899-1900	K	15,282	23,745	23,158	16,768	42
1900-1901	B	221	53,458	33,908	6,018	15
1901-1902	A	4,163	60,231	39,926	.....	.....
1902-1903	A	15,405	55,044	39,926	.....	.....
1903-1904	A	20,422	51,308	39,980	.....	.....
1904-1905	C	25,307	28,778	36,076	3,850	96
1905-1906	H & E	8,525	38,945	28,830	11,096	27·7
1906-1907	A	4,490	53,679	38,864	1,062	2·7
1907-1908	B	11,107	46,043	37,864	2,062	5·2
1908	F	10,376	36,468	25,112	14,014	35

Issue for irrigation under normal condition, *i.e.*, A-39,926 million cubic feet per year.

Exhibit Ma. 37-4.

STATEMENT showing closing balance in Mysore Reservoir at end of September or October classification, issue and deficiency for October or November to June 15th.

Year	Balance at end of September or October	Case	Issue for irrigation from November 1st or October 1st or 15th June	Total as per case A from November 1st or October 1st to 13th June	Deficiency, column 5 —column 4	Percentage of deficiency column 6 to 5
1	2	3	4	5	6	7
1896-1897	29,372	C	14,425	18,260	3,835	21
1897-1898	33,495	A	18,260	18,260	.....	...
1898-1899	34,870	A	18,260	18,260	.....	...
1899-1900	17,614 Sept.	K	6,359	23,127	16,768	72·5
1900-1901	30,871	B	12,242	18,260	6,018	32·9
1901-1902	36,573	A	18,260	18,260	.....	.....
1902-1903	34,228	A	18,260	18,260	.....	.....
1903-1904	36,376	A	18,314	18,314	.....	.....
1904-1905	28,637	C	14,410	18,260	3,850	21·1
1905-1906	22,413 Sept. 26,145 Oct.	H & E	7,164	18,260	11,096	60·8
1906-1907	34,276	A	17,198	18,260	1,062	5·8
1907-1908	30,520	B	16,198	18,260	2,062	11·3
1908	23,986	F	4,216	8,523	4,277	50·2

Exhibit My. 35.

Mysore reply to the Madras statement of case on issues 3 (b) and 4 (Ma. 35).

Most of the points contained in the Madras statement referring to the rules of regulation and the engineering details relating to the working of the sluices, gauging the river discharges, etc., have been fully discussed at a meeting before the Assessor on the 7th instant and the points of agreement have all been noted by that officer. This matter has been dealt with very fully by Madras, and Mysore have readily accepted most of the Madras proposals.

2. There are, however, some points in which Mysore cannot agree with the view taken by Madras.

These are—

(i) Extension of irrigation above and below the reservoir.
(ii) Results of working tables.
(iii) Controlling agency for operating the reservoir.
(iv) Information to be supplied to Madras.

(i) Extension of irrigation above and below the reservoir.

3. In their letter No. 1133/7521, dated the 6th September 1913, Mysore have already supplied to the Madras Government in the Public Works Department details of the areas of extensions on existing channels taking off from the existing anicuts above the reservoir. The same information was also simultaneously supplied to the Assessor.

4. The details then supplied may be quoted here for ready reference:—

		ACRES.
Area of wet land to be submerged		6,624
Do garden		650
Do land classed as dry for which wet rate is charged		2,000
	Total wet cultivation submerged ...	9.274
Add one-third more for area that can be irrigated with the same water by improving the duty		3,091
	Total area ...	12,365
Total area proposed to be irrigated by extending the channels is ...		20,000
Net new area to be irrigated		7,635

5. Thus, it will be seen that the real extension is to be only 7,635 acres. The only point about which there can be any difference is regarding the increase of the one-third of the submerged area (3,091 acres) with improved duties, shown above. Madras themselves have, in paragraph 3, Rule III (*c*) of Ma. 35, admitted an increase of 10 per cent on this account. But the present duty in these old channels is very low, the channels being very crude and the distribution quite uncontrolled. It will not therefore be too much to expect an increase of about one-third in the duty figures. If, for instance, the duty of the existing channels were taken as 30, it will not be very difficult to improve it to 40 by minimising the waste of water in tail channels.

Accordingly, 12,365 acres can be easily irrigated with the same water that was being used for the submerged lands as shown above. Thus, the balance of the area which would require extra water is only 7,635 acres and this will be distributed under three anicuts, *viz.*, Chamaraj, Mandagiri and Hemagiri Anicuts, giving a comparatively small extent under each of them.

This area of 7,635 acres is so insignificant as compared with the large extent of 1¼ million acres in Madras on the same river, as not to merit any discussion at all.

6. Further, all these anicuts, are far above the Ramaswami Anicut on the Cauvery, specified in rule II of the Agreement of 1892, as the limit above which Mysore irrigation extensions by means of anicuts across this river, could be freely carried out. According to this specific rule in the Agreement, Madras have no voice to object to the construction of even new anicuts and much less to the extension of irrigation under the old anicuts.

The mere fact that the extensions are to be made simultaneously with the construction of the reservoir with the object of settling the expropriated landowners, cannot take away this legitimate right of Mysore. Any objection of Madras, notwithstanding the specific clause in the Agreement, if countenanced, would be tantamount to a repudiation of the Agreement of 1892.

7. Supposing, for a moment, that these extensions had been carried out before the question of the reservoir was mooted, then any balance in the river, after meeting the requirements of the extensions, would have been naturally taken up partly or wholly by the irrigation below the reservoir and Madras could not evidently have raised any objection to such an arrangement. The mere fact that the river water, after meeting the requirements of the higher extensions, passes through the reservoir instead of through the natural river course, cannot make any difference to Madras, as long as the exact quantities of inflow and outflow are properly measured and accounted for, agreeably to the rules and regulations for operating the reservoir.

8. It is quite obvious that the reservoir itself cannot supply water to any area above it. If at all, it can only help the areas situated below it. The quantity of water that can be stored in the reservoir is limited. The new area proposed to be irrigated under the reservoir will require all the water that can be stored in it. Madras have also been arguing that the storage available is insufficient even for the new area proposed. In the face of all these facts, it is not understood how Madras deem it practicable to feed all the area of about 40,000 acres of existing anicut irrigation below Kannambadi by the reservoir itself except by curtailing the new area of 125,000 acres proposed under the reservoir.

9. If this curtailment is not effected, the only way by which Mysore can give away the storage water for such lower irrigation without affecting their new irrigation of 125,000 acres can only be under one of two conditions. Either the inflow or the outflow should be intentionally under-estimated. Neither of these conditions is possible with the very efficient and scientific regulation proposed at the reservoir. Mysore have repeatedly stated that their first concern will be to see that there will not be the slightest infringement of the rules once they are accepted. It is therefore obvious that no help could be given to the 40,000 acres of the existing irrigation below the reservoir without trenching on the 125,000 acres of new irrigation.

10. If, however, any real extensions under the lower channels are made involving a change in the existing head works, Mysore have already expressed their willingness to debit such extra water to the reservoir account. This would naturally mean that the new irrigation of 125,000 acres would be correspondingly reduced. Under the Agreement of 1892, Mysore have a right to extend their irrigation even under the anicuts below the reservoir if they are situated above the Ramaswami Anicut. But, on account of the disturbing conditions of the reservoir, they are willing to forego this right as noted above and to treat such extensions if undertaken as a part of the area fed by the reservoir. With this concession and with the efficient arrangements for measuring the inflow and the outflow, Mysore are sure that Madras will readily give up their untenable objection that the extensions above the reservoir should be treated as depending on the reservoir, and that due credit should be given to them by including in the inflow the amount of water that may be consumed by the comparatively very small extension of 7,635 acres now proposed under existing anicuts above the reservoir.

11. In this connection, Mysore have also to urge that, if any extensions under minor channels in the Madras territory above the Upper Anicut are undertaken, so as to involve a change in the nature and dimensions of the head works, Mysore claim that they should be given due credit for water consumed for such extensions by deducting the same from the limit flow due to Madras.

In fact, the Assesssor has distinctly expressed an opinion to this effect in paragraph 130, page 25 of A.E.E. II, quoted here for ready reference :—

"130. What in my opinion might be held reasonably to debar a claim to future supply for increases in the irrigated area since 1890 would be any proved material alteration of, or addition to, the original works or inception of a new work since that date; in which case I take it that prescriptive right could only be held to have matured under the 1892 Agreement subject to the usual limitations and with reference to the date of the addition. This view would, in fact, place these works on exactly the same footing as was accorded to similar works in Mysore by the 1892 Agreement and is consistent with the opinion I have already expressed with regard to the Mysore rights on these channels—*vide* paragraph 128."

This condition would apply to the channels below the reservoir in Mysore as conceded by Mysore above, and for the channels above the Upper Anicut in Madras.

(ii) The results of working tables.

12. As regards the results of the working tables, Mysore have already shown in paragraphs 1 to 7, My. 33, that material shortage in the reservoir is confined to only one year out of thirteen and in all other years by judicious regulation the conditions of irrigation can be more or less efficiently maintained.

They have also shown that the results, if judged by the requirements of power supply as provided in their project, are in every way satisfactory, coming up to the standard of any such big reservoir in India—*vide* paragraphs 13 and 14, My. 33.

The Madras contention that Mysore officers have not realised "that reasonable forecast of working prospects indicate material failures" cannot be sustained.

13. It is only reasonable to request that the Mysore project should be judged from the data distinctly given in the project and not upon assumptions inconsistent with the provision made in the project. Such an assumption is made in taking 1,000 cusecs as the demand for power at Sivasamudram instead of at Kannambadi as shown in the project. This increases the demand on the reservoir and naturally shows it at a disadvantage as compared with the real project, which, as already stated in paragraph 14, My. 33, is worked out on a sound and practical basis.

14. At the request of the Assessor, alternative results with the award figure of 900 cusecs at Sivasamudram have been worked out and they show that the classification of the following years has improved :—

1896-97 from C to B.
1905-06 „ E to C.
1908-09 „ F to E.

This is a distinct improvement which would be still more marked, if the project figure of 1,000 at Kannambadi equivalent to 800 at Sivasamudram, were taken.

15. A few remarks are necessary about what Madras say regarding the views of the Government of India on the project. At the time when the matter was referred to the Government of India in 1911, all the information that is now available regarding the method of impounding, rules of regulation, method of control and the daily working tables, etc., were not before them. The opinion then expressed by the Government of India was that with the insufficient information before them it was not possible to make sure that the Madras interests would be safeguarded.

Regular working tables, with the detailed scales of the draw-off to suit the different stages of storage, have now been provided and examined. The special precautions that should be observed for measuring the inflow and the outflow so as to ensure passing on to Madras of the quantity of water due to them, have also been fully discussed now. With the system of automatic control and the regulation of the distribution under scales A to K according to the different conditions of the storage in the reservoir proposed to be adopted, there is no room for any doubt that the Madras interests would be at all affected by the working of the Mysore reservoir. If all this detailed information had been available then, the Government of India would have been satisfied that, consistently with the protection of the Madras interests, the reservoir could be properly operated even though the full normal supply may not be realised in all years.

16. Mysore have already shown their willingness to increase the size of their reservoir by 4,000 million cubic feet if they find it necessary when irrigation develops under it. This increase would secure full irrigation under classification A in ten years out of thirteen. It has been shown—*vide* paragraph 14, My. 33—that a more or less similar result could be secured by reserving power water only to the extent actually provided in the project.

17. Madras have doubted that all the 25,000 acres proposed to be irrigated under the tail tanks can be met by the surplus water. It must be remembered that the surplus is not the only source of supply to this area. To this is to be added the comparatively large amount of seepage and leakage from the extensive area of 125,000 acres to be irrigated under the reservoir. The tanks have their own catchment areas. Many of them are in need of restoration. When they are so restored, a further supply can be secured. With these sources of supply in all average years, a full supply can be obtained for the area of 25,000 acres proposed under them although there may be some shortage in bad years as should be expected.

(iii) Controlling agency.

18. Madras have made a proposal to entrust the control of the reservoir regulation to an officer not under the control of the Mysore Government. On the face of it this proposal cannot bear a close examination. Even supposing, for a moment, that an outside officer is appointed and made independent both of Mysore and Madras, it is difficult to realise how he will be guided and controlled from Delhi or Simla on every occasion such guidance or control would be necessary unless very wide powers of discretion are given to such an officer.

That a mere Executive Engineer, even if appointed by the Government of India, should be an object of greater trust to Madras than the Mysore Government itself, is indeed surprising. Mysore have given no cause for any distrust on the part of Madras and strongly object to a proposal which would virtually amount to a cession of jurisdiction and control over a reservoir built by Mysore in their territory and for the benefit of their irrigation.

19. Mysore accept, as indeed they would be bound to accept, full responsibility for arranging to efficiently carry out all the duties that Madras would entrust to an outside Executive Engineer, by putting an efficient Executive Engineer of their own Public Works Department in charge of the reservoir with a competent staff under him. It will be their special concern to see that the officer so selected will operate the reservoir in strict and undeviating accordance with the rules that may be framed. It has also been conceded that any authorized Madras officer may come and inspect as often as Madras may consider necessary and that every facility would be afforded for such inspections. With these assurances and precautions, Mysore fully hope that the proposal of Madras, based on a policy of suspicion, would not in any way be countenanced.

(iv) Information regarding the details of the project.

20. As regards the nature of information to be supplied to Madras regarding the details of the project, they have themselves specified what is essentially necessary for them in the following words :—" Generally Madras are concerned with the soundness and the safety of the works and the operation of the provisions for passing water to Madras without risk of failure." Mysore are quite willing to supply this essential information.

21. But the claim of Madras to be supplied with full details relating to the alignment of the canals and the distribution of irrigation, etc., relating to the internal administration of the canal system are matters which cannot affect Madras so long as their prescriptive right is maintained unimpaired by Mysore. The information contained in the printed project book, if carefully examined, will be found quite sufficient to form a clear idea of the project and this has been supplemented by duty tables and other data in connection with the preparation of the working tables. Mysore consider that no further details are really necessary.

22. Rule III of the Agreement of 1892 prescribes that " when the Mysore Government desires to construct 'Any New Irrigation Reservoir' then full information regarding the proposed work shall be forwarded to the Madras

Government." And Rule I gives a definition of "New Irrigation Reservoirs" and other similar expressions occurring in the Agreement. The same rule also specifies only the quantity of water to be impounded and the area to be irrigated in addition to the constructive details of the reservoir, as points about which information may have to be supplied by Mysore. Although these items are mentioned in connection with the "repair of irrigation reservoirs", they can be taken to apply to "New Irrigation Reservoirs" also. Nothing is stated about the supplying of information as to where the area relative to the reservoir lies, of how the canals are aligned, etc.

23. If it was the intention that such detailed information concerning internal arrangements should be supplied in connection with the reservoirs, surely some mention would have been made of the same in the preamble of the Agreement or in the correspondence that led to it. In the face of an explicit and restricted definition occurring in the Agreement itself as to what is meant by "New Irrigation Reservoirs," there is now no justification to give an extended meaning to that expression. The "full information regarding the proposed work," *viz.*, "New Irrigation Reservoirs", is to be supplied and not "full details of the project" as contended by Madras. Thus, according to the Agreement, Madras cannot claim to be furnished with the details of the canal system, the distribution of areas, etc., about which they are not really concerned.

24. In this connection, Madras also desire to place some restriction on the draw-off for the new irrigation and bind Mysore down to the quantities shown in the working tables.

Mysore cannot by any means consent to such restrictions being imposed and cannot see what bearing these can have on the maintenance of the prescriptive right of Madras so long as the draw-off for Mysore irrigation is out of the water to which Mysore are entitled. As already stated in paragraph 16, My. 33, Mysore should have the full liberty to utilize the stored water in a manner best calculated to secure a proper return on the large amount spent on the reservoir.

A proper account of all the draw-off from the reservoir for irrigation, will, however, be maintained. This will give all the information that Madras may reasonably require.

25. As regards the cost of gauging operations being fully borne by Mysore for two years, Mysore have to record a protest against the unwarranted remarks made by Madras in this connection and regret that such expressions should have found a place in an official document. Mysore, while agreeing to bear all expenses of gauging operations conducted in their territory by their own staff, expect Madras to bear the cost of any establishment that they may choose to employ on the same operations for their own satisfaction.

KARPUR SHRINIVASRAV,
Mysore Representative.

8th May 1914.

Exhibit My. 36.

Memorandum on revised classification with 900 cusecs basis.

The issue for power with 900 cusecs at Sivasamudram will amount to 8,599 m.c.ft. against 10,243 m.c.ft. with 1,000 cusecs for the summer of 1906 which has been taken as the standard for preparing duty tables.

2. Thus, the power demand will be less by 1,644 m.c.ft. with the lower limit of 900 cusecs. For normal case A, the balance required at the end of October with an allowance of 10,243 m.c.ft. for power, was calculated as 33,500. So, for a power requirement of 8,599 m.c.ft. only, a balance of (33,500—1,644 or) 31,856 or, say, 32,000 m.c.ft., will be required for the normal case A, keeping all the other things equal.

3. Accordingly, the balances required for the other cases will be as below with the same differences between class and class, as before:—

Case A	32,000	at the end of October.
„ B	30,000	„
„ C	28,000	„
„ D	26,000	„
„ E	24,000	„
„ F	22,000	„
„ G	25,000	at the end of September.
„ H	23,000	„
„ K	18,500	„

With this revised scale the classification of the following years with the Madras balances will change as under:—

	Classification with original scale on 1,000 cusecs basis		Classification for revised scale on 900 cusecs basis	
	Balance	Case	Balance	Case
1896-97	29,372	C	29,372	B
1905-06	26,145	H & E	27,168	H & C
1907-08	23,986	F	23,986	E

4. With this explanation, there will be no difference between Mysore and Madras classifications for the years noted above.

KARPUR SHRINIVASRAV,
Mysore Representative.

8th May 1914.

Exhibit My. 36-1.

Years	With 1,000 cusecs at Sivasamudram		With 900 cusecs at Sivasamudram			
	Balance at the end of September or October	Classification	Balance	Classification	Original scale	Revised scale
1896-97	29,372	C	29,372	B	Case A 33,500	Case A 32,000
1897-98	33,495	A	33,495	A	B 31,500	B 30,000
1898-99	31,870	A	31,870	A	C 29,500	C 28,000
1899-1900	17,614	K	18,884	K	D 27,500	D 26,000
1900-01	30,870	B	30,870	B	E 25,500	E 24,000
1901-02	36,573	A	36,573	A	F 23,500	F 22,000
					at the end of September	at the end of September
1902-03	31,228	A	31,228	A	G 26,500	G 25,000
1903-04	36,376	A	36,376	A	H 24,500	H 23,000
1904-05	28,637	C	28,637	C	K 20,000	K 18,500
1905-06	22,413 September 26,145 October	H & E	23,447 September 27,168 October	H & C	.....	.....
1906-07	34,276	A	34,276	A	.....	.....
1907-08	30,520	B	30,520	B	.....	.....
1908	23,986	F	24,906	E	.....	.....

NOTE.—The balances here given are taken from the Madras tables.

KARPUR SHRINIVASRAV,
Mysore Representative.

8th May 1914.

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Exhibit Ma. 38.

Note by the Madras Representative in reply to My. 36.

With reference to Mysore note My. 36 and the table attached to it showing the result of substituting a 900 cusec power limit for the 1,000 cusecs provided for in their project.

The revised classification scale proposed by Mysore has been examined with reference to several years and is successfully applied except it fails in the case of the years 1905-1906 so far as the 4,000 million cubic feet minimum balance which is aimed at on the 15th June each year.

2. The basis of the Mysore classification is designed to leave a minimum balance of 4,000 million cubic feet on the 15th June yearly. In this year, through the adoption of the new scale, the balance is reduced from a balance of 4,490 realised under the working tables with the standard classification and a draw-off for power of 1,000 cusecs to 1,717 million cubic feet under the new classification and the 900 cusecs draw-off.

3. This shows that the alteration of classification by deducting 1,644 million cubic feet as represented by Mysore as the proper figure to give the same measure of security under the new conditions as under the standard classification with 1,000 cusecs power draw-off does not give the same measure of security and that the reduction suggested by Madras, *viz.*, 1,000 million cubic feet, as suitable, is a more suitable figure. It is represented that this indicates the allowance for the savings effected by reduction from 1,000 cusecs to 900 cusecs has been excessive and involves a risk of failure not involved in the original more carefully considered scale and that in practice the new scale would run things too fine to be safe on which criticism is not applicable to the standard classification. The balances half-monthly for the year 1905-1906 worked as a *C* class year are given in the statement enclosed.

4. Reviewing, however, the years worked on the above hazardous classification, the thirteen years give a result.

Failures class *B* three years.

Such a failure involves giving duties to monsoon crop from 1st November to 15th January.

Month	Duty acres per cusec.	
	Full duty.	Reduced scale.
November	71	109
December	109	160
January	142	282

The above represent material deficiency of supply especially in the two years 1900 and 1907 in which rain was very deficient in November and December.

5. The *C* class years are two in number. This represents still further reduced duties for the last two and a half months of the monsoon crop, the supplies of water given in these months being only one-half the normal duty requirement.

In addition only half supply is given for one month to perennial crop.

This is a very material deficiency.

6. There is one "*H* and *C*" class year involving the same deficiencies as regards monsoon crop as a *C* class year and in addition reduction during October of supplies to the monsoon crop to one-half the normal. This is a very material failure.

7. There is one *E* class year which represents—

For the monsoon crop half supply for two and a half months as for *C* class.

For perennial crop reduction in area by over 55 per cent.

Reduction of water-supply for perennial crop for three months from November to January of 40 per cent. of normal duty.

This represents a serious failure.

8. As regards the year 1899, it still remains in the same class as before class *K* and represents a disastrous failure.

As before, out of the thirteen years, only six years are shown to be immune from failure.

W. M. ELLIS, COL., R.E.,
Madras Representative.

9th May 1914.

Enclosure.

Statement showing balance in Mysore reservoir from November 1905 to June 1906 under new classification and standard classification.

Half-months	Classifications *H* and *C* balance in the reservoir, new classification 900 cusecs draw-off for power.	Classifications *H* and *E* balance in Mysore reservoir as per working table standard classification 1,000 cusecs draw-off for power.
1905—		
October second-half	27,168	26,145
November first-half	25,420	24,667
,, second-half	23,672	23,204
December first-half	22,202	22,004
,, second-half	20,620	20,680
1906—		
January first-half	19,342	19,252
,, second-half	18,723	18,623
February first-half	17,476	17,691
,, second-half	15,899	16,415
March first-half	14,010	14,848
,, second-half	11,819	13,001
April first-half	9,603	11,092
,, second-half	7,354	9,150
May first-half	5,145	7,257
,, second-half	3,584	6,054
June first-half	1,717	4,490

Exhibit Ma. 39.

Note by the Madras Representative on gauge-readings during the tentative period.

The Government of Madras instruct me to bring to notice that, in the period of four years or more which must elapse between the dissolving of the Arbitration Committee and the fixing of *permanent* proportion factors, a most accurate record of gauge-readings at various places in Mysore and Madras are necessary for the purpose of the further inquiry necessary for fixing permanent factors.

It is even more necessary to ensure the accuracy and admissibility of the gauge-readings on which the permanent factors must be fixed than of the gauge-readings on which water will be regulated under the rules of working the reservoir after the work comes into operation.

2. It is therefore desirable that the steps to be taken to secure the accuracy of such gauge-readings and their acceptance by both parties should now be arranged so that the necessary arrangements may at once be made to give effect to them as may be agreed on, so that time may not be lost in future correspondence as disagreements arise with regard to the necessities involved in procuring the data required for the future settlement of proportion factors and the acceptance by both parties of such data.

3. The Government of Madras therefore put forward the following proposals and hope that they may be acceptable to Mysore and may be treated as non-contentious.

It is asked that whatever may be now agreed on should be formally recorded in proceedings for the guidance of both parties during the four years' period of enquiry which is to follow.

Proposed rules for gauge-readings and records during tentative period.

I. During the period of gauging and until the "tentative factors" are fixed, the following information as regards gauge-readings should be furnished between 1st June and the 31st January yearly.

(i) *By Madras to Mysore Government—*

Daily—Post cards showing for previous day, gauge-readings, morning and evening, and shutter regulation at the Upper Anicut.

Weekly—Post card showing daily gauge-reading, Bhavani Bridge over the Cauvery, and gauge-readings of the last two anicuts on the Bhavani and the Pallipolliem Anicut on the Amaravati.

(ii) *By Mysore to Madras Government—*

Daily—Post card with gauge-reading and detail of sluice regulation, Sivasamudram Anicut.

Weekly—Post cards in approved form of gauge-readings above and below anicuts and of regulation of sluices at :—

(*a*) Sriramadever Anicut on the Hemavati.
(*b*) Alalkatte Anicut on the Cauvery.
(*c*) Ayerhalli Anicut on the Lakshmanathirtha.
(*d*) Hulhalli Anicut on the Kabbini.
(*e*) Chik Devaroy Sagar and Devaroy Anicuts below Kannambadi.
(*f*) Also, at any other anicuts on the Cauvery below Alalkatte and on the Hemavati below Sriramadevar Anicut and above Kannambadi where gauge-readings are being taken.

(*g*) Further, when any new gauging stations and gauges are erected in connection with this enquiry, daily gauge-readings of each of these to be furnished weekly to the Madras Government.

(iii) Similarly, for any new gauging stations which it may be agreed to establish in Madras, the gaugings shall be furnished daily or weekly to Mysore as desired.

II. During this period the officers of either Government are authorised to visit without notice any of the gauging stations and to be given free access to the water and regulation registers kept by the staff of the other Government and to check generally the accuracy of the records and the method of maintenance of the same and that each Government should give the officers of the other Government every reasonable facilities and assistance in carrying out such inspections.

III. At least one automatic water level recorder to be installed within twelve months at or near each of the sites selected as standard gauging stations for the Cauvery, Hemavati and Lakshmanathirtha above the reservoir waterspread and at the standard gauging station between the dam and the Chick Devaroy Sagar Anicut in Mysore and in Madras at the Cauvery Dam in connection with the standard (north) gauge at that place.

That photo copies of the registers of these gauges should be made as soon as the records are removed from the recorders and copies should be at once furnished by each Government to the other during the tentative period as arranged for in the rules for regulation for the reservoir.

IV. That, if either Government wish to establish a gauge station or instal an automatic water level recorder at any other stations than the above and the other Government do not agree to the necessity of the same, the former be permitted and given facilities for carrying out such work at their own expense. The copies of gauge-readings or photos of records taken at such stations to be communicated to the other Government and facilities for inspection and verification afforded as regards such stations provided for regarding another gauging station.

V. That the discharges of the Cauvery Dam shall be computed from level of the north gauge from the curve of 1909 as in the Madras Cauvery Project unless superseded by an accepted and more correct curve and method of computation.

VI. That further rules or any amendment of these rules for guidance during the "tentative period" may be made by agreement of both Governments or, in case of disagreement, by order of the Government of India after hearing both parties.

W. M. ELLIS, COL., R.E.,
Madras Representative.

12th May 1914.